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UNILATERAL EXOPHTHALMOS

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Exophthalmos or proptosis is usually considered, and rightly so, to be due to something in the orbit pushing the eye forward. Only a careless observer would confuse the different conditions in which the eye itself is enlarged, e. g. buphthalmos, with the protrusion of a normal eye, or at least a normal sized eye, in advance of its normal or natural position. The "something," i. e. the cause of the exophthalmos, may be one of a variety of things, and some of them and what is best to do for them will be briefly considered.

Instruments to measure the protrusion have been devised, so that one does not have to depend on the sense of sight or touch to know when an eye protrudes beyond its fellow. The best known instrument is the Hertel exophthalmometer, a satisfactory instrument though somewhat difficult to use. It must be carefully applied to the outer orbital rim and kept in the same position on each side to give a perfect reading. A simpler instrument is the transparent one devised by Luedde, but since the position of the two eyes is not measured at the same time it requires great care to be sure that the instrument is similarly placed on each side in turn. The normal reading with the Hertel instrument seems to be about 15 mm., but it is variable.

The character of the protrusion differs with different causes. With some conditions that cause a general overfilling of the orbit by a general increase in its contents the eye projects straight forward and moves fairly well in every direction. This is the condition seen, for instance, in exophthalmic goiter. A tumor within the muscle cone, if not too large, produces the same effect, but a large tumor in the cone tends to move and displaces the eyeball to the side. Other tumors in the orbit, i. e. outside the muscle cone, push the eye to one side. It is astonishing to what extent an eye can be displaced without causing diplopia, even when the vision is normal and binocular vision unimpaired.

EXOPHTHALMIC GOITER

There is no occasion to discuss here the nature of exophthalmic goiter, especially since it is not known why, or exactly how, hyperthyroidism causes exophthalmos, and nothing at all is known as to why it sometimes produces unilateral exophthalmos. The treatment is, in the first place, the treatment of hyperthyroidism, which may be medical or surgical according to circumstances, but the one symptom of proptosis may determine the nature as it does the urgency of the treatment. There are two operations which might be done on the eye, in case the condition is extreme or persistent and is not cared for by a protective bandage: One of these is tarsorrhaphy and the other is the orbital decompression operation devised by Naffziger, which consists in the removal of more or less of the roof of the orbit and sometimes the roof of the optic canal as well. This is not an operation for the ophthalmic surgeon, but it and the operation for the relief of the hyperthyroidism as well may find their chief indication in the exophthalmos and the danger to the eye which it involves.

Cases may be cited to illustrate this condition, in one of which the thyroid disturbance was not manifest for a long time after the proptosis, a not unusual condition:

CASE 1.—Mrs. L. C. G., aged 23, complained of protrusion of the left eye in 1935. In May 1936 the neck was swollen and the exophthalmometer measured 12 and 19 mm. The eye was otherwise normal, vision was 6/6 and the patient was able to read Jaeger's test type 1. She had been advised that she had a tumor and that the eye should be removed. If this statement was correct, the condition had apparently been considered an orbital tumor and exenteration of the orbit was considered. The basal metabolism was +16. An operation for goiter in June arrested the progress of the exophthalmos and relieved her of nervousness and other symptoms of hyperthyroidism. In October 1939 she was seen for an acute exudative choroiditis in the left eye, the condition being otherwise unchanged (fig. 1).

CASE 2.—V. L., a man aged 27, complained in 1933 of exophthalmos of the left eye of two months' duration. The vision, eyeground, nose, throat and sinuses were normal. The general physical examination was negative and the metabolic rate was normal. The exophthalmometer measured 15 and 20 mm. The orbit was explored from in front and some adventitious tissue was removed from within the muscle cone. It was reported to be an "epithelial-like medullary tumor, infiltrating the orbital fat." There was no change in the eye, and the patient was referred to a neurologic surgeon, Dr. R. E. Semmes, for an orbital decompression. No tumor was found at operation, but the extra-ocular muscles were hypertrophied, as has been found by Naffziger in such cases. The operation was followed by paralysis of the superior rectus muscle. In January 1935 the patient showed symptoms of hyperthyroidism, with a metabolic rate of +46 and a very rapid pulse. A subtotal thyroidectomy relieved these symptoms, but the eye is unchanged in 1940 (fig. 2).

ORBITAL TUMOR

A tumor almost anywhere in the orbit causes the eye to protrude, because the only direction in which it can move is forward. If the tumor is directly behind the eye, i. e. in the muscle cone, it will push the eye directly forward, as has been mentioned. Such a tumor may grow so large that it protrudes to one side, and then the eye is displaced to the opposite side. Various motor disturbances and ulcerations of the cornea from exposure

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may follow, but these are variable and of no diagnostic value as far as the size, location and character of the tumor are concerned. A tumor in the muscle cone may or may not involve the optic nerve.

Case 4.—R. L., a man aged 33, was referred to me by Dr. Grace Tankersly of Pine Bluff, Ark., Jan. 27, 1933, for protrusion of the right eye of six months' duration. The eye was pushed straight forward and, from statements of his friends, the condition had existed much longer than six months. Vision was normal but the eye accepted a + 2 D. sphere, while the fellow eye had normal vision and did not accept a glass at all. There was orthophoria in the primary position, but motion was impaired up and in and up and out. There was a variable and uncertain diplopia which could not be mapped on the tangent screen. The fundus was best seen with + 2, and the edges of the disk were blurred, but the nerve was not swollen. The veins were full and the physiologic cup was narrow but otherwise the eye was normal. Nothing could be felt in the orbit. The exophthalmometer reading was right eye 20 mm. and left eye 12 mm. Roentgen examinations of the sinuses gave negative results. The nose was normal. A tumor at the apex of the orbit seemed the most likely explanation of the symptoms. An operation was done July 18 with the patient under an anesthesia secured by hypodermic injection of morphine and scopolamine and a retrobulbar injection of procaine hydrochloride and epinephrine. A free canthotomy was done and the conjunctiva was incised vertically over the external rectus muscle. This muscle was then divided near its insertion and access obtained to the muscle cone. Gradually and by blunt and gentle dissection a dark tumor was separated from the other tissues, and on account of the difficulty of seeing its deep relations and for fear of damaging the optic nerve the growth was cut in two, after which the posterior half was easily and under full view separated from its connections and removed. There was negligible bleeding. The external rectus muscle was united to its tendon stump with catgut, the conjunctiva was closed with a continuous silk suture and one suture was put in the canthotomy wound. Recovery was uninterrupted. Some diplopia was present, but in October 1933 the vision was normal, the exophthalmometer measured 10 and 12 mm., and there was defective downward rotation. A vertical diplopia was corrected by a 10 degree prism base down in front of the right eye (figs. 4 and 5).

Fig. 2.—Unilateral exophthalmos of the left eye from exophthalmic goiter.

Fig. 4. — Retrobulbar tumor (angioma) of the right eye, in the muscle cone, before operation.

The section showed small and large, irregular, endothelial lined spaces filled with blood and separated by fibrous tissue stroma. A moderate amount of lymphocytic infiltration was present. The surface was surmounted by a fibrous tissue capsule. The diagnosis was cavernous hemangioma.

Case 5.—L. H., a Negro girl aged 15 years, gave an indefinite history of protrusion of the right eye and failing vision from no apparent cause. The right eye was prominent and turned inward and upward. Motion was preserved except outward. The proptosis measured 25 mm. with the exophthalmometer, as compared to 15 mm. in the left eye. The pupil was dilated and fixed and the eye was blind. There were postneuritic atrophy of the optic nerve and some tortuosity of the veins; otherwise the eyeground was normal (fig. 6).

The general physical examination and examination of the nose and sinuses were negative and there was no pulsation of the eye. A smooth movable mass about the size of the eyeball could be felt down and out. A vertical incision was made through the conjunctiva near the limbus to the outer side of the cornea, and the external rectus muscle was exposed and divided. The tumor was found to involve the optic nerve, beginning about 10 mm. back of the globe. The nerve was cut between the eye and the tumor and, an attempt to remove the tumor by a snare being unsuccessful, was cut off as far back as possible with scissors (fig. 7). The cut muscle was united and a firm dressing applied. Two weeks after the operation there was no protrusion of the eye, but for a time there was third nerve paralysis on the right side, which disappeared. The cosmetic result was satisfactory.

Fig. 6.—Primary intradural tumor of the optic nerve of the right eye, before operation.

The changes in the eyeground were very interesting. Ten days after the operation there were edema of the whole central region of the retina and a cherry red spot at the macula. The vessels seemed normal except that an artery above the macula showed a broken blood current. Pressure on the eye did not cause pulsation of the vessels but readily emptied them of blood.

In a month the edema was gone. In the macular region a few fine white dots and lines were seen. Near the disk, especially upward, was a deposit of dots of black pigment on a pale yellowish background. Pigment was also being deposited on the disk, giving the appearance of ashes thickly sprinkled on snow. Two months after the operation there were more pigment deposits, almost covering the disk. The vessels were slightly attenuated, especially the arteries.

The diagnosis made was moderately slow growing glioma or, better, fibroglioma (the "fibro" referring to, or indicating, neuroglia fibrils and not connective tissue fibrils). Because of many vascular channels with wide lumens in the specimen, the diagnosis "telangiectatic glioma" may be more accurate.

This case was reported in The Journal July 8, 1916.[1]

Case 6.—A Negro girl aged 3 years was seen in 1915 with a protruding left eye and a vague history concerning it. The exophthalmometer measured 11 and 21 mm. The left eye moved laterally but not vertically, protruded forward and a little downward and was blind, but the nerve and fundus were normal. Nothing was felt in the orbit, and roentgen and general physical examinations gave negative results. The operation, proceeding as for an enucleation, exposed a tumor involv-

1. Ellett, E. C.: A Primary Intradural Tumor of the Optic Nerve, J. A. M. A. 67:104 (July 8) 1916.

ing the optic nerve and reaching to the apex of the orbit. This was removed with the eyeball, but I think now that it was not necessary to remove the ball. The tumor was a glioma (figs. 9 and 10).

This case was reported in the *Annals of Ophthalmology* in July 1916.[2]

OTHER TUMORS

Other varieties of solid tumors are found which vary in nature and location.

CASE 7.—Mrs. F. F. B. aged 27 was referred by Dr. Robert Mason of Murray, Ky., in August 1931 for a swelling above the right eye of several years' duration. There was some difficulty in vision, especially in reading. A round firm tumor could be felt in the upper outer part of the orbit, and the exophthalmometer measured 18 and 14 mm. respectively. There was a weakness of convergence and the right eye moved poorly both to the right and to the left. The eyeground and media were normal, fields were normal and vision was 6/20. With a + 0.75 D. sphere ⌒, a + 0.75 cylinder and a 105 axis vision was 6/6 and she was able to read Jaeger's test type 4. General physical examination showed no abnormalities; the blood, urine, nose and sinuses were all normal. The protrusion of the right eye increased and in February 1933 it measured 20 mm. Operation was done in October 1933. The tumor was exposed by an incision through the skin and an encapsulated tumor was removed. In the summer of 1934 a lesion was found at the macula of the right eye consisting of a whitish center, with reddish borders and slight pigmentation below. Vision of the left eye was 6/15 with a + 1.00 D. sphere ⌒, a + 1.00 cylinder and a 110 axis, and she was able to read Jaeger's test type 6. (figs. 11 and 12).

Two pathologists examined the lesion and differed in their reports as follows: .

Dr. M.—Section shows an alveolar tumor. The acini vary in size and are filled with acid-staining secretion like that of thyroid tissue. Diagnosis, aberrant thyroid; adenoma.

Dr. S.—The mass consists of strands of average sized dark polyhedral cells with average sized dark round or elliptic nuclei, frequently surrounding small and large irregular spaces of colloid. The fibrous tissue stroma and blood vessels are scarce. The mass is surrounded by a hyaline fibrous tissue capsule. Diagnois, mixed tumor.

MIXED TUMORS ELSEWHERE

CASE 8.—W. S., a youth aged 20, was seen on May 18, 1931, for advice concerning a protrusion of the right eye which had been coming on gradually for about twelve years. There had been no discomfort till the last five weeks, when there was some headache. The left eye was normal in every respect. The vision in the right eye was 6/10, improved to 6/6 and the ability to read Jaeger's test type 1 with glasses. The right eye protruded and was pushed down and out. The exophthalmometer measured 22 mm. of the right and 12 mm. of the left eye. The eyeball was normal except for a mat of vessels under the conjunctiva at the inner canthus. Motion was normal but there was diplopia when a red glass was put in front of the eye, the right image going up and to the right. The retinal vessels of the right eye were more tortuous than the left. Roentgenograms were negative except that the right orbital opening seemed larger than the left. The nose and sinuses were normal. A large, firm, somewhat elastic mass could be felt in the inner upper angle of the orbit, lying so deep that only the anterior surface could be felt. It was slightly movable and the skin and overlying tissues could be moved over it. Roentgen therapy was given without effect, and the condition showed but little change in any way until October 1933, when consent was given to an operation. On October 13, under local anesthesia and morphine and scopolamine, an incision

Fig. 13.—Fibroma of the orbit of the right eye, before operation.

Fig. 19.—Hyperostosis of the orbit of the right eye.

was made through the skin over the tumor and it was exposed, grasped with forceps and enucleated without much difficulty. The growth was encapsulated and firm and reached to the apex of the orbit, but it was not attached to the bone or muscles. It was about the size of the eyeball and weighed 11 Gm. The wound was closed with a cigaret drain and healed promptly. Vision was somewhat impaired for a time (6/12) and motion of the eye was limited in all directions, especially inward. The patient was seen again in January 1934. Vision was then 6/6 with glasses and motion was normal, but there was vertical diplopia of 40 degrees with a red glass before one eye, the left image being above. Fusion was obtained with a 40 degree prism, base up, left eye, and a 4 degree prism, base in. The exophthalmometer measured 11 and 12 mm. In March 1934 the exophthalmometer showed 10 mm. for both eyes, vision was normal with glasses and the pupils were 6 mm. and 5 mm. and active. Motion was normal but vertical diplopia of 50 degrees was present with a red glass before one eye, varying from this to 15 degrees. The right palpebral fissure was wider than the left. Photographs of the specimen and the pathologist's reports indicate the nature of the tumor (figs. 13, 14 and 15).

The specimen consisted of a capsule covered, nodular, firm mass measuring 3.5 by 2 by 2.5 cm. On section it was firm, gray and translucent, in one area white and gritty and in another area a yellowish brown.

Microscopic sections showed a hyalinized fibrous tissue, poor in nuclei and blood vessels and surrounded by a fibrous tissue capsule.

The diagnosis was fibroma.

CASE 9.—Dr. J. S. D., aged 72, was seen in May 1922 with the statement that the right eye had not been normal for a year and that for five months it had been protruding. The exophthalmometer measured 22 and 16 mm. There was variable diplopia, motion was limited except downward, and a soft mass could be felt above the eye and seen through the conjunctiva. The eyeball was normal. Under ether, a cutaneous incision was made below the brow, but since the exposure was

2. Ellett, E. C.: Optic Nerve Tumor, Ann. Ophth. **25**: 435 (July) 1916.

insufficient without too much pressure on the eye the incision was carried around the rim of the orbit, and a temporary resection of the outer orbital wall was done. The tumor, consisting of three separate parts, was removed. The parts measured respectively 22 by 27 by 7 mm., 33 by 14 by 9 mm. and 10 by 16 by 6 mm. They were alike microscopically, all being small round cell sarcomas. Healing was uneventful. Vision was

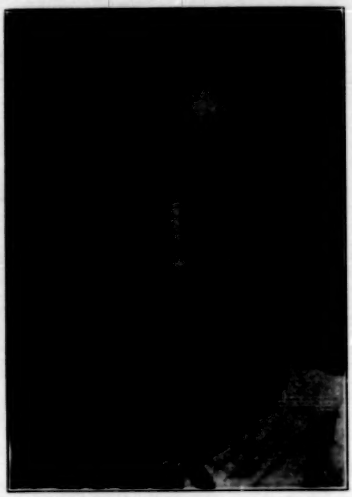

Fig. 22.—Sebaceous cyst of the orbit of the left eye, before operation.

temporarily impaired and motion slowly returned. Six months later vision was 20/30; there was diplopia in the lower temporal field, poor outward motion and ptosis, and the fundus was normal. The patient lived nine years and had no local recurrence and no metastasis (figs. 16, 17 and 18).

Case 10.—Mrs. B., aged 45, in 1913 had been subject to severe headaches for four years, and for about two years the right eye had been prominent. The projection was not very marked and the vision, eyeground and ocular movements were normal. There was nothing to be felt in the orbit, and the nose and sinuses were normal. In 1918 vision was 20/60 and the eye was more prominent. Figure 19 shows how she looked in 1920. Roentgenograms indicated an osteoma, but they were not at all good. In October 1920 she was admitted to the Touro Infirmary in New Orleans with a diagnosis of osteoma of the right temporofrontal region and orbit, complicated by panophthalmitis, acute nephritis and edema of the lungs. The eye was enucleated and three days later the patient became unconscious from uremic coma and died. This case was apparently one of hyperostosis rather than of osteoma, since osteoma originates in the sinuses. Leontiasis ossea can be excluded because it usually affects other bones than those of the orbit.

Case 11.—W. K., a boy aged 15 years, a patient of Dr. W. W. Hatcher of Imboden, Ark., was seen in December 1929. The left eye had converged five or six years before and he had worn glasses, with a diagnosis of paralysis of the left external rectus muscle. Vision was said to be good at first and there was diplopia, but the vision gradually failed. There was headache over the left eye and the left eye protruded. The left nostril was obstructed. A large hard mass could be felt at the inner side of the orbit, and a hard smooth swelling could be seen in the left nostril. Vision was limited to ability to count fingers at 6 inches, owing to atrophy of the optic nerve. The exophthalmometer measured 14 mm. and 21 mm. A roentgenogram showed islands of bone in the tumor, and the growth itself reached from the floor of the nose to the floor of the cranial cavity and was about the same size from in front backward and laterally. It was considered inoperable. He was given roentgen and symptomatic therapy. The growth extended, the right optic nerve atrophied and the lenses showed some opacity, especially the left. He died in 1938, nine years after the first examination (fig. 20).

Case 12.—J. I. I., a Negro man aged 79, complained that his left eye had been watering and red for a month and was getting worse. There was a firm swelling below the eye, lying beneath the whole lower lid, slightly elastic and apparently attached to the periosteum. Motion was limited, especially downward. The eyeball was normal but protruded. Vision was 6/7.5. The Wassermann reaction was negative. Roentgen examination was negative. There was no glandular involvement. The tear duct was not involved. Operation was advised but declined (fig. 21). The patient subsequently saw Dr. Thomas P. Mannigan, who informed me that a specimen was taken for biopsy and was reported as a granulomatous inflammation. The section suggested blastomycosis, but no fungi were found.

Case 13.—J. W., a boy aged 12 years, gave the history that at the age of 1½ years the left eye turned in and protruded. This slowly increased and the vision failed. Vision in the normal right eye was 15/25 and in the left eye 3/200. A smooth, firm tumor filled the upper outer quadrant of the left orbit, pushing the eyeball so that it turned in and protruded. The eye was otherwise normal, but the fundus details were blurred. Under

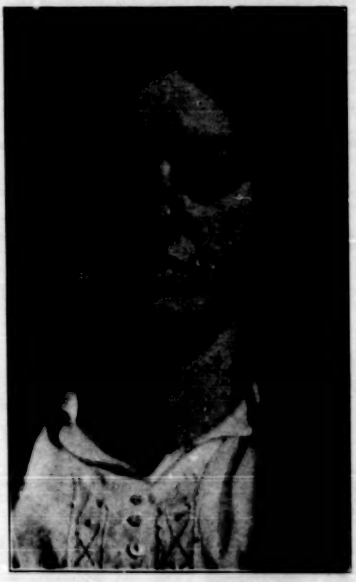

Fig. 26.—Hemangioma of the orbit of the left eye, before operation.

ether anesthesia a canthotomy was done and the tumor removed through an incision in the conjunctiva. The growth was a sebaceous cyst and lay outside the muscle cone and was not attached to the periosteum or muscles. The deformity, apparent in figure 23, was due to (1) the canthotomy, (2) enlargement of the bony orbit from pressure and (3) absorption of the orbital fat. The eye still turned in, and outward motion was defective (figs. 22 and 23). The last photograph of the patient (fig. 24) was taken fourteen years after the operation.

VASCULAR TUMORS

Another type of tumor is the vascular tumor. The characteristics of these are slow growth, a bluish discoloration and the fact that nothing is usually to be felt in the orbit and that removal of part of the tumor seems effective in relieving the proptosis. These seem to me to be the most difficult cases in which to operate, because there is no difference in the consistency of the tumor and the orbital fat and connective tissues, so that they are not well defined; but the tumor consists of a series of spaces with connective tissue septums, and if they are ruptured and the blood escapes it is practically impossible to remove them satisfactorily. A feature of this type of tumor is that it is frequently congenital. The difficulties of performing the operation on a small child are great, and since the tumors are often stationary or of very slow growth it is feasible and advisable to defer surgery till the child is several years old. In the meantime roentgen or radium therapy should be tried, with considerable prospect of a good result. The technical difficulty of operation in such cases has been mentioned. If some safe method of coagulating the blood in an angioma in this situation could be found it would make the operation very easy, but one hesitates to introduce coaggulating fluids into a tumor which probably communicates freely with the intracranial sinuses and which cannot be surely cut off by ligature or otherwise from its deep connections.

Fig. 29.—Hemangioma of the orbit of the left eye, before operation.

CASE 14.—Mrs. S. was first seen when she was a girl of 15, in 1911. At the age of 9 years the left eye had protruded for a while and then receded to an almost normal position until three months before her visit, when it again protruded. There was constant pain, diplopia and protrusion of the eye. The vision and eyeground were normal but the tissue of the orbit had a cystic feel in the upper and outer angle. The nose and sinuses were normal. The patient was not seen again for nine years, when there was a soft blue tumor visible in the upper and outer portion of the left orbit. It did not pulsate, but the eye now protruded 14 mm. beyond the fellow eye. The eyeground and vision were normal, so it was decided to attempt to remove the tumor without disturbing the eye. Exposure through the conjunctiva and muscle did not give sufficient room, so a temporary resection of the external wall of the orbit was done. Through this opening the larger part of the tumor was removed, but not all of it could be reached, as it extended to the apex of the orbit; nor could it be readily differentiated from the other orbital tissues, and removal of the eye was not intended. After two years the vision was normal and the eye protruded 5 mm. (figs. 25, 26 and 27).

The pathologic report was not satisfactory. Either the specimen was mixed with some other in the laboratory or the examination was made of some other part of the mass than the tumor itself. Clinically the growth was a cavernous angioma.

CASE 15.—L. W., a girl aged 13 years, was seen in 1934. The left eye had been protruding for four years. The nose and sinuses were normal. In the orbit a soft mass could be felt down and in. The exophthalmometer measured 13 and 26 mm.; vision was normal. Exploration of the orbit from in front, down and in, on May 13, 1937, gave negative results. On May 21 Dr. Semmes explored the orbit from above and thought that he found and coagulated a small angioma at the apex of the orbit. This operation was followed by ptosis and slight lessening of the exophthalmos. In February 1938 a firm mass could be felt down and in, and the lid over this location was discolored (bluish). Under ether anesthesia this was exposed by a conjunctival incision and a firm dark mass was dissected out. The pathologic report was cavernous hemangioma. The motion of the eye is now limited, the nerve is pale and the field is much contracted up and in. Vision is 6/6 with glasses, the right pupil measures 5 mm. and is active and the left 7 mm. and feebly active. The vessels are normal (figs. 28, 29 and 30).

PSEUDOTUMOR

A curious group is that described as pseudotumor, illustrated by the following cases:

CASE 16.—Mrs. M. I., aged 45, was seen in August 1939 complaining of sudden failure of vision and protrusion of the right eye of two weeks' duration. Significant points in her history were a severe right-sided pain in the face following the extraction of a tooth and a right-sided deafness in April 1939 which lasted a month. No explanation was found for either of these events. The present illness began with pain in the right side of the face. Examination showed a normal left eye and a protruding right eye, paralysis of the sixth and paresis of the third and fourth cranial nerves on the right side. The pupil reacted feebly, consensual action being better than direct. The fundus was essentially normal. The impression was that of an aneurysm or tumor. The patient went to Baltimore; Dr. Dandy furnished the subsequent history. He was suspicious of aneurysm but operated on account of increasing pain. There was no tumor seen intracranially and the orbital roof was removed. When the orbital capsule was split, a large amount of orbital fat protruded and some was removed. A hard small round nodule was found at the apex of the orbit, fixed and lying beneath the optic nerve. It was removed and found to be composed of chronic inflammatory tissue.

The diagnosis was pseudotumor.

The photographs reproduced in figures 31 and 32 were taken nearly a year after the operation. There was then no apparent exophthalmos but optic nerve atrophy and paralysis of the right third nerve.

CASE 17.—H. P., a man aged 63, said that following a trifling injury to the left eye in 1938 he lost his vision and a year later the eye began to swell. When seen in April 1940 the left eye protruded and was painful. The exophthalmometer reading was 10 and 22 mm., and there was a swelling of the left temporal region, as shown in his photograph. Motion was limited in all directions. The nose was open but a roentgenogram showed that the left antrum, sphenoid and ethmoids were cloudy and there was an erosion of the external wall of the orbit. The nerve was white, the vessels were normal, the eye was blind and tension was normal. Nothing could be felt in the orbit. It seemed that an infiltrating growth was present, invading the orbit and adjacent sinuses and breaking through into the zygomatic fossa. Roentgen treatments seem to be reducing the size of the mass and have relieved the pain, which was a prominent symptom (fig. 33).

Fig. 36.—Schüller-Christian's disease (unilateral exophthalmos) of the right eye.

GENERAL DISEASE AS CAUSE

Certain general diseases can cause unilateral exophthalmos and should be borne in mind by the ophthalmologist. Two of these are chloroma and xanthomatosis. I cannot show a picture of the former but can of one

of the forms of xanthomatosis, namely Schüller-Christian's disease. It is due to a disturbance of lipoid metabolism with a deposit of lipoids in the tissue, the characteristic lesions being in the bones, as may be seen in roentgenograms. The significant signs of this condition are exophthalmos, large defects in the bones of the skull, and diabetes insipidus. The optic nerve and retina may be involved, with impairment of sight. The sight may also suffer from exposure of the cornea. Another related form is mentioned by Knapp [4] as a tumor of the orbit arising from the frontal bones which (1) forms a tumor below the upper bony margin of the orbit, causing exophthalmos, (2) causes a defect in the frontal bone, (3) presents certain histologic peculiarities, (4) has slow growth and (5) is benignant. This is very different from such forms of xanthomatosis as Schüller-Christian's disease. Roentgen treatment is about all that

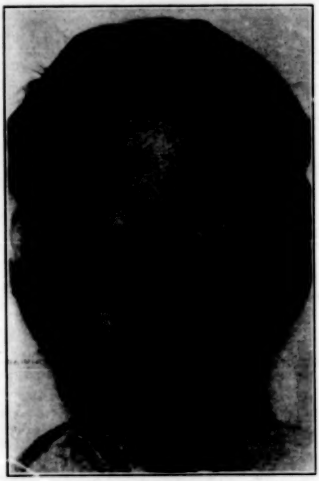

Fig. 42.—Unilateral exophthalmos of the left eye of unknown origin.

can be done, and the child whose case I report seemed to improve and was symptomatically well when she died:

CASE 20.—Mary J. H., aged 6 years, was seen in September 1936. Two years previously she had aching joints, because of which her tonsils were removed. For three months the right eye had protruded, and at times there was a discoloration around the orbital region. A nodular mass could be felt in the orbit, down and out. Motion and vision were normal. A swelling of the disk, thought to be pseudoneuritis, was present in both eyes. The exophthalmometer measured 25 and 15 mm. The general physical examination was entirely negative, but roentgenograms showed patches characteristic of xanthomatosis. These lesions, together with flabby muscles, especially the masseters, were the basis of the diagnosis of Schüller-Christian's disease. This is due to disturbed lipoid metabolism. The deposit in the skull and long bones resembled osteomyelitis. The exophthalmos, the lipoid deposits in the bones and the diabetes insipidus are the usual diagnostic signs of Schüller-Christian's disease (figs. 36, 37, 38 and 39).

The blood showed 82 per cent hemoglobin, nearly 4,000,000 red cells and 8,000 white cells, with 45 per cent polymorphonuclear leukocytes, 49 per cent small lymphocytes, 3 per cent transitional forms and 3 per cent eosinophils. Roentgen treatment caused marked improvement, especially in the exophthalmos, which receded to 15 mm., and in general strength, but the child died a few months later.

4. Knapp, Arnold: Xanthomatosis of the Orbit, Arch. Ophth. 11: 141 (Jan.) 1934.

INTERMITTENT EXOPHTHALMOS

The following is one of the unusual cases of intermittent exophthalmos:

CASE 21.—C. D., a man aged 51, a patient of Dr. T. C. Chapman of Brownsville, Tenn., had for twenty years noticed when he stooped, when he had a cold or when he had on a tight collar that the left eye protruded. Vision in each eye was 6/20 and with proper glasses it was 6/6 and the patient was able to read Jaeger's test type 1. Both eyes when at rest were normal inside and out. Pressure on the right angular vein had no effect, but pressure on the left one caused protrusion of the left eye, with congestion of the conjunctival vessels and enlargement of the retinal veins of both eyes. The condition is probably due to a vascular tumor in the left orbit which was of negligible size unless filled with blood by some obstruction to the venous flow of blood from the head.

Such cases are not very rare. One reported by Petrov [5] in a woman aged 25 was thought to be due to dilated orbital veins caused by an endocrine disturbance (fig. 40).

METASTATIC TUMOR OF ORBIT

Unilateral exophthalmos may be caused by a metastatic tumor of the orbit. Of several cases which I have seen, the following is a good example:

CASE 22.—Mrs. A. G. K., aged 69, had been treated with roentgen rays for some weeks for a lump in the left breast which had first been noticed ten months before I saw her. The progress of her condition was said to be favorable, but for four weeks the left eye had been watering and protruding. The right eye was normal except for beginning cataract. The left eye was inflamed and protruded and was pushed down and out. The exophthalmometer measured 15 and 24 mm. A firm mass could be felt at the upper and inner angle of the orbit and there was a soft protrusion in the orbit down and out, which may have been orbital fat. The retinal veins were very full and tortuous and there were some linear hemorrhages near the disk. Apparently these were due to pressure on the vein after its exit from the eye. The orbital trouble was thought to be metastatic, and palliative treatment was advised (fig. 41).

UNKNOWN ETIOLOGY

I will add one case of uncertain origin, and I wonder that I have not seen more such cases:

CASE 23.—M. O., a youth aged 17, in the spring of 1936 fell and bruised the left temporal region slightly. Three or four months later the left eye began to protrude and soon reached its present state and has not changed. Vision is normal, ocular movements are normal and the retinal veins are enlarged and tortuous. The exophthalmometer measures 13 mm. and 20 mm. Physical and roentgen examinations of the nose and sinuses are negative. Nothing abnormal can be felt in the orbit. The external rectus muscle was divided and the interior of the muscle cone was exposed and explored. Nothing abnormal was found. The patient has been examined by many physicians, but a positive diagnosis has not been made (fig. 42).[6]

COMMENT

With regard to operative treatment there are two things that I should like to say. One is that, as shown many years ago by Dr. Herman Knapp and advocated by Felix LaGrange, most of these lesions can be reached through the conjunctiva to the outer side of the eyeball,

5. Petrov, A. A.: Case of Unilateral Intermittent Exophthalmos, Vestnik oftal. 14: 76, 1939.

6. This patient has since been operated on through the orbital roof and a dermoid tumor removed.

with the addition of a canthotomy and possibly a temporary resection the external rectus and a Krönlein operation is not often necessary. If a Krönlein operation is to be done it is far better to introduce a Gigli saw through the sphenomaxillary fissure and cut with it, as suggested by Magitot, than to do the bone work with a chisel or forceps. One caution in using a Gigli saw is to keep the hands far apart. If they are close together and the arms of the saw are nearly parallel, the saw will invariably bind and break. Spaeth and Wiener have described similar plans and both seem favorable to the Krönlein operation. Spaeth feels that the greater the exophthalmos the more likely is the Krönlein operation not to be necessary. Benedict and Fred Davis have described approaches through the upper and lower lids and through the conjunctival cul-de-sac below, which give good exposure with a minimal postoperative deformity.

1720 Exchange Building.

LONG-TERM RESULTS IN THE TREATMENT OF EARLY SYPHILIS

PAUL PADGET, M.D.

BALTIMORE

The final evaluation of any system for the treatment of patients with early syphilis must, in the nature of the disease, depend on long term post-treatment observation of a large group of patients. This principle has long been recognized, especially by those who of necessity have attempted the evaluation of modern treatment methods on the basis of a few patients followed for long periods, and larger series in which the period of observation was shorter.[1] These previous authors have not purposely limited themselves; simply because of the time intervals involved, no large group of patients followed for long periods after modern treatment for early syphilis has heretofore been available. It is now possible partially to supply this deficiency.

THE MATERIAL

From among the patients with early syphilis who had been admitted to the syphilis division it was possible to find 551 who had been completely reexamined five or more years after the termination of the original treatment (i. e., that given during the first two years of therapy). Two hundred and seventy-three of these patients had been followed for more than ten years to a mean of fourteen years of post-treatment observation; the mean in those followed from five to ten years was 7.6 years and for the group as a whole was 10.8 years.

Supported in part by funds provided by the United States Public Health Service.

From the Syphilis Division of the Medical Clinic, the Johns Hopkins Hospital and University.

Read before the joint meeting of the Section on Practice of Medicine and the Section on Pharmacology and Therapeutics at the Ninety-First Annual Session of the American Medical Association, New York, June 14, 1940.

1. Clark, Taliaferro; Parren, Thomas; Cole, Harold N.; Moore, Joseph Earle; O'Leary, Paul A.; Stokes, John H., and Wile, Udo J.: Cooperative Clinical Studies in the Treatment of Syphilis, Ven. Dis. Inform. **13**:135 (April) 1932. Stokes, John H.; Cole, Harold N.; Moore, Joseph Earle; O'Leary, Paul A.; Wile, Udo J.; Clark, Taliaferro; Parran, Thomas, and Usilton, Lida J.: Cooperative Clinical Studies in the Treatment of Syphilis, ibid. **13**:207 (June), 253 (July) 1932. Vonderlehr, R. A., and Usilton, Lida J.: The Chance of Acquiring Syphilis and the Frequency of Its Disastrous Outcome, ibid. **19**:396 (Nov.) 1938. Martenstein, Hans: Syphilis Treatment, Quart. Bull. Health Organ., League of Nations **4**:129 (March) 1935. Snodgrass, W. R., and Peters, R. J.: An Analysis of the Results of Treatment of Early, Latent and Mucocutaneous Tertiary Syphilis, Medical Research Council, Special Report Series, No. 224, His Majesty's Stationery Office, 1937. Moore and Kemp.[4]

The age distribution of the patients on admission revealed nothing of significance but by race and sex there were more Negro women at the expense of the men of both races than was typical of the clinic population.

THE FINAL OUTCOME

In the evaluation of results the final outcome was taken as the status observed at the time of institution of any later treatment for syphilis irrespective of the total period of observation. This was necessary to avoid the confusion of attempting to analyze the effect of treatment for late syphilis sometimes scattered over years of sporadic visits. It has the disadvantages of presenting in the overall results of treatment the final worst obtained in life and of excluding from consideration deaths as such. There were seventeen of the latter, ten of which were due to syphilis and seven to a variety of other causes.

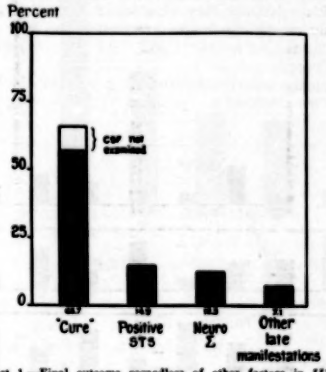

Chart 1.—Final outcome regardless of other factors in 551 patients with early syphilis.

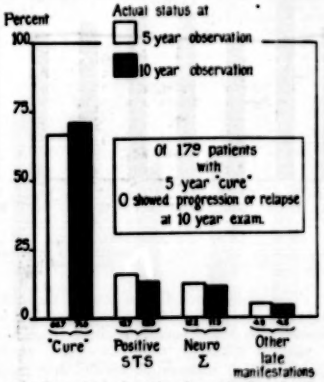

Chart 2.—Comparison of results of examination of 268 patients at approximately five and ten or more years after the termination of treatment for early syphilis. Illustrating the apparent permanence of a five year "cure."

The final outcome by this definition is given for the entire group in 551 patients in chart 1.

For the purposes of this study "cure" originally was defined as established by reinfection [2] or by freedom from symptoms and signs of syphilis to careful examination, repeatedly negative results to blood serologic tests, normal roentgenograms of the cardiovascular stripe where taken, and a normal cerebrospinal fluid. Three hundred and fourteen patients (57.0 per cent) satisfied these criteria. In addition there were 48 patients (8.7 per cent) who satisfied all of the criteria save examination of the cerebrospinal fluid. At first dealt with separately, they were found to be distributed so evenly among the larger group that the two were combined, making a total of 362 (65.7 per cent) classified as "cure."

Among the unfavorable results, 82 patients (14.9 per cent) were classified as "positive STS," meaning that

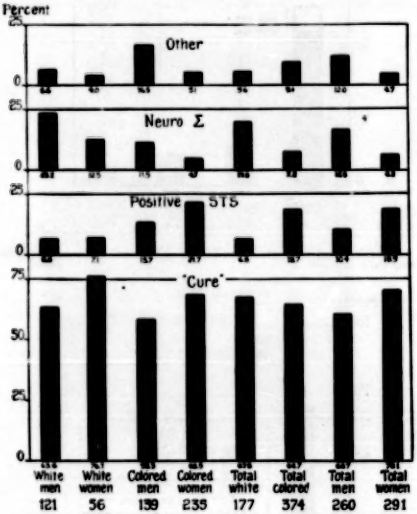

Chart 3.—Final outcome by race and sex. Note particularly among the unfavorable results the incidence of neurosyphilis in white men and of positive STS in colored woman. (Vertical columns total 100 per cent.)

complete examination including a test of the cerebrospinal fluid had revealed no evidence of syphilitic infection save that the blood gave a positive reaction to a serologic test.

The more certainly unfavorable results were made up of 68 patients (12.3 per cent) with some form of neurosyphilis and 39 patients (7.1 per cent) with some other late manifestation of the disease. Among these was the dramatic instance of treatment resistance reported by Hood.[3]

THE PERMANENCE OF THE FIVE YEAR RESULT

In the following analysis of the results of treatment, no distinction is drawn between the 278 patients who were followed for from five to ten years and the 273 patients who were observed for ten years or more. This consolidation is justified by the data of chart 2, in which it is to be noted, in contrast to elsewhere, that the comparison is between the actual status observed and not the arbitrarily defined outcome.

Of the 273 patients who were last examined ten or more years after the termination of the original treatment for early syphilis, 268 had been examined at about a five year period of observation, and on this basis 179 were classified as "cure." At the later examinations none of these manifested progression or relapse. On the contrary, eleven additional patients had converted latent or late syphilis to "cure" without further treatment for three, and there was no significant redistribution of the observed outcome among the remainder in spite of further treatment for most.

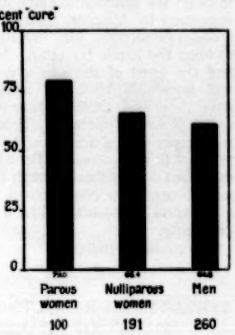

Chart 4.—Apparent influence of sex and pregnancy on final outcome.

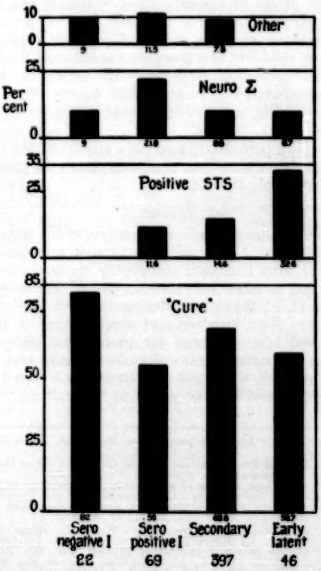

Chart 5.—Influence on the final outcome of the stage of syphilis at the onset of treatment.

This permanence of the five year results among the patients who had done well deserves emphasis, but its greatest importance lies beyond the scope of the present communication.

2. Halley, C. R. L., and Wasserman, Harry: Second Infection in Syphilis; Its Relation to the Time of Treatment of the First Infection, Arch. Int. Med. 41:843 (June) 1928.

3. Hood, Bowman J.: An Unusual Case of Arsphenamine Resistance, Am. J. Syph., Gonor. & Ven. Dis. 21:97 (Jan.) 1937.

Analysis of the final outcome by race and sex is illustrated in chart 3. The small group of white women achieved the greatest percentage of "cures" (76.1) and the Negro men the least (58.3) with the other two race-sex divisions between (63.6 and 68.5 for white men and Negro women respectively). Of more importance, however, is that among those who did not achieve "cure" neurosyphilis was two and one-half times as frequent among the white. The Negroes suffered cardiovascular syphilis and other late manifestations more often, but the majority of the unsatisfactory results observed in this race consisted in the persistence of a positive serologic test for syphilis in the blood without other manifestations of the disease. The analysis by sex revealed an equally striking difference; among those with an unfavorable outcome, neurosyphilis was more than two and one-half times as common among men as among women.

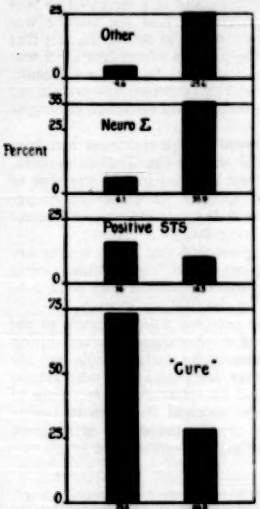

Chart 6.—The ominous prognostic significance of observed relapse.

Breaking down the sex differences into the further question of the possible influence of pregnancy, chart 4 contrasts the percentage "cures" obtained by the men, the nulliparous women, and those women who had sustained one or more pregnancies concomitant with or subsequent to acquiring syphilis. A much higher percentage of the last group (79) than of either of the former (60.8, 65.6) attained "cure," tending to confirm the previous observations that pregnancy exerts a beneficent effect on syphilitic infection. In the present instance, however, it is difficult to be sure that the differences are significant.

The influence on the final outcome of the stage of the disease at the onset of treatment is shown in chart 5. Among the 534 patients who received treatment of any kind, the best results were observed among those who began treatment in the seronegative primary stage, of whom 82 per cent achieved "cure." The worst results obtained to those whose treatment began in the seropositive primary stage, of whom only 55 per cent were so fortunate. In the other groups the incidence of "cure" was 68.8 per cent in those with secondary syphilis at the onset of treatment and 58.7 per cent of those who were in the early latent stage of the disease.

As first pointed out by Moore and Kemp,[4] these differences are probably to be explained by the disrupting effect of treatment on the immune reaction of the host. This effect is least important in the seronegative primary stage, in which "cure" is so readily effected; it is greatest in the seropositive primary stage, in which

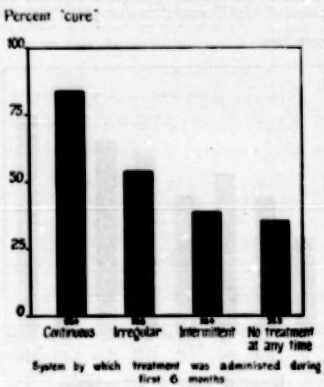

Chart 7.—Outcome with reference to the system of treatment for the first six months.

immunity is developing but is imperfect, and is intermediate in the patients with secondary and early latent syphilis, among whom the immune response is reaching or has reached its height. A further development of this thesis offers an explanation for the lower percentage

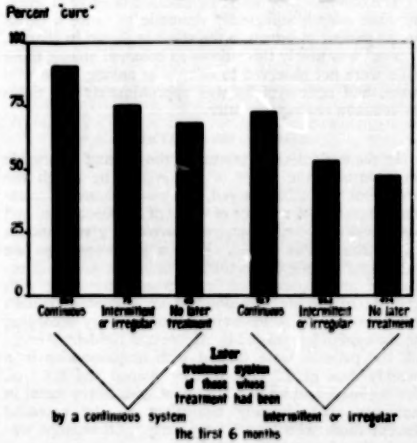

Chart 8.—Outcome with reference to the system of treatment after the first six months. Note that continuation of irregular treatment did not improve the final results.

of "cures" among the patients with early latent syphilis at the onset of treatment, since so many of them (32.6 per cent) were found to be seroresistant at the last examination. It is postulated that in at least some of these the persistence of a positive serologic test in the

4. Moore, Joseph Earle, and Kemp, Jarold E.: The Treatment of Early Syphilis: II. Clinical Results in 402 Patients, Bull. Johns Hopkins Hosp. 39:116 (July) 1926.

blood with no other manifestation of syphilitic infection may reflect the persistence of immunity rather than of disease.

Detailed analysis of the type of unsatisfactory result experienced by the various groups brings out only one other point of significance; neurosyphilis was two and

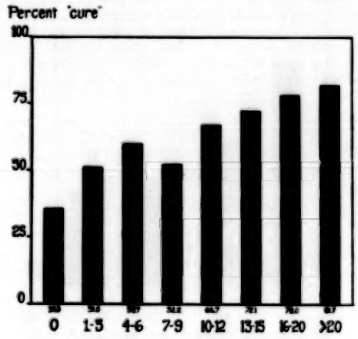

Chart 9.—The relationship between the final outcome and the number of doses of arsphenamine administered during the first two years.

one-half times as common among those who began treatment in the seropositive primary stage as among the others and accounted for the increased incidence of unsatisfactory results in this group.

The ominous prognostic significance of early or intermediate relapse sufficiently dramatic to cause a delinquent patient to return to the clinic is shown in chart 6. "Cure" was nearly three times as common among those who were not observed to relapse as among those who were, and neurosyphilis was approximately six times as common among the latter.

RESULTS OF TREATMENT

In the evaluation of treatment the attempt was made to determine the effect of the system by which the treatment was administered, the total amount of treatment in terms of number of doses of arsphenamine, and the effect of the time span over which a given amount of treatment was spread. With a few exceptions the attempted scheme of treatment was by the weekly injection of an arsphenamine in courses, alternating with courses of weekly injections of an insoluble bismuth compound or daily inunctions with mercury according to the system formulated by Moore and Keidel.[5] Almost all the patients were treated with arsphenamine in a weekly dose of 0.3 Gm. for the women and 0.4 Gm. for the men, and all had treatment with heavy metal in amounts approximately equivalent to the arsenical except those who lapsed very early. No attempt was made therefore to compare drugs.

It is here perhaps appropriate to emphasize that, although this system for the treatment of early syphilis has been employed for more than twenty years, it is only now possible to gain an appropriate long term estimate of the results to be obtained from its use. The several schemes recently proposed for the treatment of early syphilis which involve radical departure from this method do nothing to alter the basic biologic nature of the disease; long term follow-up after treatment has been suspended is necessary to a final revaluation of results.

The final outcome according to the system by which treatment (irrespective of amount) was administered during the first six months is shown in chart 7, and chart 8 gives the final outcome according to the system by which later treatment was carried out.

The superiority of the continuous treatment system over the intermittent and irregular systems is readily apparent. "Cure" was attained by 83.4 per cent of the patients whose treatment during the first six months was by a continuous system, and this increased to 90.4 per cent if treatment after the first six months was likewise continuous. In contrast to this is the fact that only 53.8 per cent of the patients whose treatment was intermittent or irregular during the first six months enjoyed a similar fate, and this outcome was not altered (53.2 per cent) by the further administration of irregular treatment.

On the other hand, even though treatment had been intermittent or irregular during the first six months, later continuous treatment resulted in 72.7 per cent of "cures," while the incidence of "cure" fell to 75 per cent among those whose first treatment was continuous but who later became irregular.

It is doubtless of significance that these figures are approximated by the 68 per cent of "cures" found among those who had had no further treatment after some continuous treatment during the first six months.

Chart 9 presents the outcome with reference to the total number of doses of arsphenamine received during the total period of treatment for early syphilis and the incidence of "cure" rises from 35.3 per cent among the 17 patients who had no treatment at any time to two thirds of those who received from ten to twelve and finally to 81.7 per cent of those who were given more than twenty injections of arsphenamine.

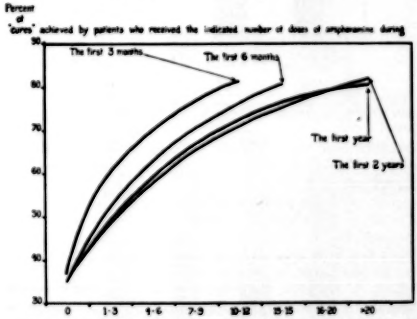

Chart 10.—Illustrating the time factor in syphilotherapy. Patients who received any given amount of arsphenamine did better the shorter the period during which it was given (within the limits of the study).

The incidence of "cure" with regard both to the amount of treatment and to more detailed analysis of the time during which it was given is shown in chart 10. There it may be seen that the final outcome depended not only in a directly quantitative fashion on the number of doses of arsphenamine received but also inversely on

5. Moore, Joseph Earle, and Keidel, Albert: The Treatment of Early Syphilis: I. A Plan of Treatment for Routine Use, Bull. Johns Hopkins Hosp. 39:1 (July) 1926.

the time span during which they were given. Patients who received any stated amount of arsphenamine did better the shorter the time period in which it was administered, serving further to emphasize the necessity of absolute continuity of treatment.

SUMMARY AND CONCLUSIONS

1. The results of the long-term post-treatment observation of a group of 551 patients with early syphilis were studied, just less than two thirds of whom attained "cure" as defined.

2. Among those with an unfavorable outcome, there were the same race and sex predilections and relation between outcome and stage of disease at the onset of treatment which previously have been noted by others.

3. Comparative examination at approximately five and ten or more years of observation revealed that all patients who satisfied the criteria of "cure" at the former continued to do so at the latter.

4. The final outcome was found to depend on both type and amount of treatment.

5. The results clearly indicate the superiority of the alternating continuous treatment system and emphasize that continuity should be absolute.

6. The results from irregular treatment were so inferior as strongly to suggest its complete uselessness, especially after the first few injections.

101 West Read Street.

ABSTRACT OF DISCUSSION

DR. JOSEPH EARLE MOORE, Baltimore: This is the first large scale long term evaluation of treatment results in early syphilis available. From it may be singled out three points for special comment: 1. Padget's data justify the opinion that in early syphilis five year "cure" represents permanent "cure." Patients who were clinically and serologically normal five years after treatment ended were still normal after five or more further years of observation. From the purely scientific point of view, the data are as yet inadequate to permit this statement to be too dogmatically made; and the necessity of further long continued observation of these and similar patients still continues, in order particularly to rule out the later development of cardiovascular syphilis, the average incubation period of which is twenty to twenty-five years after infection. From the more purely practical individual and public health point of view, however, the apparent fact of the permanence of five year "cure" is of great importance, since it does permit some relaxation of post-treatment follow-up, after the fifth year of observation, in general medical and clinic practice. 2. The curability of early syphilis is favorably influenced by the amount of arsenical treatment given in the early months, preferably the first three months. The more trivalent arsenical given in this time period the better the chance of ultimate "cure." This fact has perhaps an important bearing on the new "five day treatment" of early syphilis by massive dose and continuous intravenous drip. Nevertheless it is to be observed from Padget's data that patients who receive so little treatment as only four to six injections of an arsphenamine by conventional divided dose technic have a 60 per cent chance of five year "cure" with practically no risk of hemorrhagic encephalitis or death. The incidence of the serious reaction of hemorrhagic encephalitis with conventional methods of treatment is probably somewhere between one in 15,000 and one in 25,000 patients treated. With the new "five day treatment," the chance of "cure" probably lies somewhere between 70 and 85 per cent, depending on whether mapharsen or neoarsphenamine is used; i. e., a chance of "cure" only 10 to 25 per cent greater than from only four to six conventional doses of an arsphenamine, and no greater than with the best available continuous outline of treatment applied for twelve to fifteen months; but with a risk of the development of hemorrhagic encephalitis of approximately 1 in 100 patients treated, i. e. a risk one hundred and fifty to two hundred fold greater than with conventional methods. 3. Even with a few injections of an arsphenamine only, patients may be maintained indefinitely in a state of health, as far as syphilis is concerned, in the proportion of about 80 per cent. With the best available conventional methods of treatment, 90 per cent of patients achieve long term "cure" by both clinical and serologic standards, and the amazingly high total of 95 per cent are clinically "cured."

STREPTOCOCCUS CONVALESCENT SERUMS (SCARLATINAL)

THE POTENTIALITIES OF TYPE-SPECIFIC POOLS

ERLING S. PLATOU, M.D.
PAUL F. DWAN, M.D.
AND
ROBERT E. HOYT, PH.D.
MINNEAPOLIS

Of the various streptococcus antiserums that have been employed to date, scarlet fever antitoxin and pooled convalescent scarlet fever serum have found the greatest favor clinically. Since the rise in popularity of these serums, precise classification of the streptococci has been achieved by serologic methods. Hemolytic streptococci of human origin have been classified by Griffith into thirty known types, of which twenty-six are included in Lancefield's group A while four fall into groups C and G. It has been shown by Green,[1] Bailey,[2] White,[3] Keogh,[4] Allison[5] and de Waal[6] that certain serologic types usually predominate in an epidemic of scarlet fever. Many of the types associated with clinical scarlet fever are proficient in producing erythrogenic toxin and as a result commercial scarlatina antitoxin, which has a high neutralizing titer, has become more and more popular in the treatment of this disease. Some immunologists feel that too much stress has been laid on erythrogenic toxin as a weapon of the hemolytic streptococcus and that not enough consideration has been given to such products as streptolysin, leukocidin, fibrinolysin and the spreading-factor of Duran-Reynals and to the organism's invasive ability. Okell,[7] Zinsser,[8] Topley and Wilson,[9] Griffith,[10]

From the Departments of Pediatrics and Bacteriology, University of Minnesota Medical School.
Dr. Joyner of the Lederle research laboratory furnished us with known type cultures and typing serums.
All convalescent serum was obtained from the University of Minnesota serum laboratory. Standard toxin and antitoxin was procured from the National Institute of Health.
Read in the panel discussion on Some Contagious Diseases before the Section on Pediatrics at the Ninety-First Annual Session of the American Medical Association, June 13, 1940.

1. Green, C. A.: The Serological Types of Hemolytic Streptococcus in Endemic Scarlet Fever, J. Hyg. **37**: 318-331 (April) 1937.
2. Bailey, J. H.: The Types of Hemolytic Streptococcus Concerned with Scarlet Fever, J. Bact. **31**: 80-81 (Jan.) 1936.
3. White, C., and Rand, G. V., and Ward, H. K.: The Serological Types of Haemolytic Streptococci Causing Scarlet Fever in Sidney, M. J. Australia **1**: 96-100 (Jan. 21) 1939.
4. Keogh, E. K.: Observations on the Epidemiology of Streptococcus Infections, M. J. Australia **1**: 100-103 (Jan. 21) 1939.
5. Allison, V. D.: Streptococcal Infections, Lancet **1**: 1067-1070 (May 7) 1938.
6. de Waal, H. L.: The Serological Types of Hemolytic Streptococcus in Relation to the Epidemiology of Scarlet Fever and Its Complications, J. Hyg. **40**: 172 (March) 1940.
7. Parish, H. J., and Okell, C. C.: Two Studies of Streptococcal Infections: Hemolytic Streptococcal Infections in Rabbit; Relationship of Scarlet Fever to Other Streptococcal Infections, Lancet **1**: 746 (April 14) 1928. Okell, C. C.: Role of Haemolytic Streptococci in Infective Disease (Milroy Lecture), ibid. **1**: 761 (April 9), 815 (April 16), 867 (April 23) 1932.
8. Zinsser, Hans; Enders, J. F., and Fothergill, L. D.: Immunity: Principles and Application in Medicine and Public Health, New York, Macmillan Company, 1939, p. 582.
9. Topley, W. W. C., and Wilson, G. S.: Principles of Bacteriology and Immunity, Baltimore, William Wood & Co., 1936, p. 1158.
10. Griffith, F.: Types of Hemolytic Streptococci in Relation to Scarlet Fever, J. Hyg. **28**: 385 (Nov.) 1926, **30**: 363 (Oct.) 1927; Serological Classification of Streptococcus Pyogenes, ibid. **34**: 542 (Dec.) 1934.

Lancefield[11] and others believe that any streptococcus of group A may produce scarlet fever, septic sore throat, erysipelas, paronychia or puerperal sepsis and that "the clinical picture is determined by a number of factors, such as the portal of entry, the tissue infected and, most important of all, by the properties of the

Chart 1.—Comparative bacteriostatic effect.

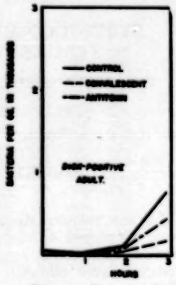

Chart 2.—Comparative bacteriostatic effect.

organism which characterize it as virulent and invasive, together with the toxic substances secreted and the immunologic reactions of the host to these several biological circumstances."

It would seem that the ideal antiserum for treatment of a group A streptococcus infection, whether that infection appears as scarlet fever or some other clinical entity, will be one that is:

1. Rich in antibodies directed against all of the previously mentioned group weapons of the streptococcus.
2. One which contains an abundance of type-specific antibodies.
3. One which is homologous.

Although cellular factors are important in streptococcus immunity, as has been shown by Gay and his co-workers,[12] it is believed as the result of clinical and experimental experience that humoral antibodies, especially opsonins, have a prominent role in the recovery mechanism. Lyons,[13] as a basis for his method of selective immunotransfusion, showed that young virulent streptococci resisted phagocytosis in nonimmune blood and that their phagocytosis could be brought about only by the addition of type-specific opsonins to the blood. These type-specific substances may be procured by pooling convalescent serum from different sources; but such a method necessitates the dilution of each type by the others and thus renders the serum less effective from the standpoint of type specificity. To avoid dilution as much as possible, serum depots now collect convalescent serum early in an outbreak for use during the course of the epidemic. The action of pooled convalescent serum on such toxic factors as erythrogenic toxin and leukocidin, which are group specific and not type specific, is not affected by the pooling.

A proposed improvement of pooled convalescent serum is type-specific serum in which only good antibody donors are included as determined by test. Hyperimmunization of convalescent donors with a vaccine of the homologous organism and pooling of serums according to type is another possible method of procuring better convalescent serum. Streptococcic infections such as scarlet fever, puerperal sepsis and septic sore throat could by this means be treated with a serum rich in type-specific antibodies as well as in group-specific antibodies.

Studies were first carried out to determine the effect of pooled convalescent scarlatina serum on virulent group A streptococci recovered from scarlet fever cases, and of individual convalescent serum against the homologous organism isolated during the disease. In addition, hyperimmunization of convalescents has been attempted in order to determine whether it is possible to increase the antitoxic and antibacterial titers of donors' serums.

To demonstrate the action of pooled convalescent serum on streptococci, young virulent cultures were added to samples of whole blood. Convalescent serum was then added to one sample. Normal serum was substituted for convalescent serum as a control, and an equal volume of commercial antitoxin diluted one to ten was added to a third sample of blood. The blood used in these studies as a source of phagocytic cells was obtained from infants 1 to 3 months of age and from Dick-positive adults. Coagulation of the blood was prevented by the addition of heparin, and in some cases the blood was defibrinated. To make the amounts of convalescent serum and antitoxin approximate those usually administered clinically, we have in most cases diluted the concentrated antitoxin ten times.

A sample of blood from one source was divided into three portions of 6 cc. each. To the first of these (the control) was added 2 cc. of serum from an infant or a Dick-positive individual, to the second 2 cc. of pooled convalescent serum was added and to the third 2 cc. of commercial antitoxin. The bacterial inoculum was prepared by diluting a twelve hour culture grown on veal-infusion broth until 1 cc. contained from 100 to 300 chains. Two cc. of this dilution was added to each

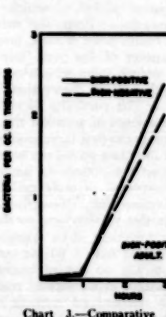

Chart 3.—Comparative bacteriostatic effect.

Chart 4.—Comparative bacteriostatic effect.

portion of blood and serum, bringing the total volume of each to 10 cc. This made a final dilution of 1:5 for the normal serum and the convalescent serum and 1:50 for the commercial antitoxin. After thorough mixing the various samples were placed in test tubes, stoppered and rotated on a revolving wheel in the 37 C. incubator. The red cells of the blood were tested for compatibility with the convalescent serum added. At varying intervals samples were removed from each mixture,

11. Lancefield, R. C.: Antigenic Complex of Streptococcus Haemolyticus: Demonstration of Type-Specific Substance in Extracts of Streptococcus Haemolyticus, J. Exper. Med. 47:91 (Jan.) 1928; Chemical and Immunological Properties of Protein Fractions, ibid. 47:469 (March) 1928; Chemical and Immunological Properties of Species-Specific Substance, ibid. 47:481 (March) 1928; Anaphylaxis with Two Non-Type-Specific Fractions, ibid. 47:843 (June) 1928; Anaphylaxis with Type-Specific Substance, ibid. 47:857 (June) 1928.
12. Gay, F. P., in Jordan, E. O., and Falk, I. S.: Newer Knowledge of Bacteriology and Immunology, Chicago, University of Chicago Press, 1928.
13. Lyons, Champ: Immunotransfusion and Antitoxin Therapy in Hemolytic Streptococcus Infections, J. A. M. A. 105:1972 (Dec. 14) 1935.

the number of viable organisms was determined by the pour plate method and smears were stained for determination of phagocytic indexes. After two hours it was usually necessary to make serial dilutions of the blood to obtain a distribution of organisms which would permit accurate counting. The number of organisms per cubic centimeter present at a given time was obtained by deriving the mean count of three plates and multiplying this value by the dilution factor.

It is seen in chart 1 (table 1) that streptococci are capable of growing without interruption in infant blood to which normal serum has been added. Substitution of commercial antitoxin to a sample of the blood, instead of normal infant serum, did not affect the rate of growth. When pooled convalescent serum was substituted for normal serum a pronounced bacteriostatic effect resulted. All tubes in this experiment received an inoculum of 14 organisms per cubic centimeter. By the end of one hour the control and the antitoxin tubes each contained approximately sixty organisms per cubic centimeter, while the mixture containing pooled convalescent serum contained only twenty-five organisms per cubic centimeter. This relative difference persisted for several hours.

The inhibitory effect of convalescent serum as shown in the experiment in which infant blood was used as a source of phagocytic cells is considerably less than that which is shown in subsequent charts illustrating the action of adult blood. This difference may be explained by the well known fact that infant blood contains many less polymorphonuclear leukocytes than does the blood of an adult.

Chart 5.—Comparative bacteriostatic effect.

Chart 2 shows the results obtained when blood from a Dick-positive adult was used as a source of phagocytic cells. A striking difference between the effect of convalescent serum on the one hand and commercial antitoxin and normal serum on the other hand is apparent. Again it is seen that commercial antitoxin exerts no antibacterial action in vitro. The initial decrease observed in the control tube is probably due to the fact that the individual, though possessing no antitoxic immunity (as shown by the positive Dick test) does have some degree of antibacterial immunity.

Charts 3 and 4 also demonstrate the in vitro inhibitory action of pooled convalescent serum in contrast to the negative effect of normal serum and commercial antitoxin when each is added to whole adult blood containing active phagocytes.

In the next experiment (chart 5) the blood of a toxin-immunized Dick-negative individual was inoculated with streptococci and compared with blood from a Dick-positive individual which was inoculated in the same way. No difference in bacteriostatic activity of the two blood samples could be demonstrated. This suggests that, whereas successful immunization to the point of a negative Dick test produces a desirable antitoxic immunity, it brings about no antibacterial immunity as determined in vitro.

Clinical evidence of this antigenic inadequacy on the part of erythrogenic toxin is afforded by the occurrence of streptococcic sore throat in a group of nurses at the Minneapolis General Hospital. Of twelve immunized nurses serving in scarlet fever wards, eleven who were known to be Dick negative contracted streptococcic sore throat, while one nurse who had been immunized but who had failed to become Dick negative contracted an identical sore throat. The latter nurse developed a mild scarlatinal eruption, which was followed by desquamation. The relatively mild course of all who became ill suggested that their antitoxic immunity may have been beneficial.

TABLE 1.—*Infant Blood*

Hours	Tube	Count	Dilution	No. per Cc.
0	All	14	0	14
1	1. Control	12	1:5	60
	2. Convalescent serum	5	1:5	25
	3. Antitoxin diluted 1:10	11	1:5	55
2½	1. Control	137	1:10	1,370
	2. Convalescent serum	93	1:10	930
	3. Antitoxin diluted 1:10	160	1:10	1,600
4	1. Control	286	1:100	28,600
	2. Convalescent serum	190	1:100	19,000
	3. Antitoxin diluted 1:10	360	1:100	36,000
5½	1. Control	360	1:1000	360,000
	2. Convalescent serum	275	1:1000	275,000
	3. Antitoxin diluted 1:10	425	1:1000	425,000
10	1. Control	125	1:1,000,000	125,000,000
	2. Convalescent serum	111	1:1,000,000	111,000,000
	3. Antitoxin diluted 1:10	150	1:1,000,000	150,000,000

A case now under observation further bears out the failure of antitoxic immunity to confer antibacterial immunity. A boy aged 10 was immunized to the point of a negative Dick test. Six months later, while attending school where scarlet fever was known to exist, he contracted a typical "scarlet fever" sore throat with no rash and later developed lymphadenitis and acute glomerulonephritis as complications. A type 13 hemolytic streptococcus, which according to Topley and Wilson has been observed as a cause of sporadic scarlet fever, was recovered from the boy's throat.

TABLE 2.—*Dick-Positive Adult*

Hours	Tube	Count	Dilution	No. per Cc.
0	All	5	1:5	25
½	1. Control	3	1:5	15
	2. Convalescent serum	0	1:5	0
	3. Antitoxin diluted 1:10	2	1:5	10
1	1. Control	1	1:5	5
	2. Convalescent serum	1	1:5	5
	3. Antitoxin diluted 1:10	1	1:5	5
1½	1. Control	4	1:5	20
	2. Convalescent serum	2	1:5	10
2	1. Control	20	1:5	100
	2. Convalescent serum	9	1:5	45
	3. Antitoxin diluted 1:10	17	1:5	85
3	1. Control	150	1:5	750
	2. Convalescent serum	31	1:5	155
	3. Antitoxin diluted 1:10	82	1:5	410
5	1. Control	4,000	1:5	20,000
	2. Convalescent serum	650	1:5	3,275
	3. Antitoxin diluted 1:10	2,000	1:5	10,000

Moreover, puerperal sepsis due to strains of streptococci which often cause scarlet fever have been found to occur just as commonly in Dick-negative as in Dick-positive individuals by Colebrook [14] and others.

14. Burt-White, Harold; Colebrook, Leonard; Morgan, Gertrude; Jervis, Beatrice J. W., and Harre, Gertrude E.: A Study of Cutaneous Sensitiveness to Scarlatinal Toxin in Pregnancy and the Puerperium, Brit. M. J. 1:240 (Feb. 8) 1930.

Failure of commercial antitoxin to prevent scarlet fever in several exposed individuals that we have observed is additional proof that antitoxic immunity in scarlet fever, however desirable, is not operative as an antibacterial immunity. Two of our patients who had serum reactions died of bacteremia and streptococcic laryngotracheobronchitis respectively. Hartshorn and

TABLE 3.—*Dick-Positive and Dick-Negative Adult*

Hours	Tube	Count	Dilution	No. per Cc.
0	All	22	None	22
1	1. Whole blood from Dick-positive adult	8.5	1:5	43
	2. Whole blood from Dick-negative adult	10	1:5	50
3	1. Whole blood from Dick-positive adult	24	1:100	2,400
	2. Whole blood from Dick-negative adult	20	1:100	2,000
5	1. Whole blood from Dick-positive adult	203	1:1000	203,000
	2. Whole blood from Dick-negative adult	164	1:1000	164,000
9	1. Whole blood from Dick-positive adult	24	1:1,000,000	24,000,000
	2. Whole blood from Dick-negative adult	31	1:1,000,000	31,000,000

Chandler [15] have reported four cases of scarlet fever in which the onset of bacteremia coincided with the beginning of serum disease. The spread of infection by this method has in fact been demonstrated by Burn [16] and the aforementioned authors in animals.

The usual doses (20 cc.) of pooled convalescent serum have been found inadequate in protecting against scarlet fever in a few cases in our experience [17] and it may be that even larger doses of antibacterial serum or combined serum and chemotherapy are necessary in order to provide thoroughly adequate antibacterial immunity.

It should be pointed out that in the antibacterial studies which have been described a relatively large quantity of serum was employed as compared to the amount injected in prophylactic procedures, though

TABLE 4.—*Control, Convalescent Serum, Antitoxin*

Hours	Tube	Count	Dilution	No. per Cc.
0	All	22	None	22
1	1. Control	8.5	1:5	43
	2. Convalescent serum	3	1:5	15
	3. Antitoxin diluted 1:10	13	1:5	65
3	1. Control	24	1:100	2,400
	2. Convalescent serum	85	1:10	850
	3. Antitoxin diluted 1:10	207	1:10	2,070
5	1. Control	203	1:1000	203,000
	2. Convalescent serum	600	1:100	60,000
	3. Antitoxin diluted 1:10	2,000	1:100	200,000
9	1. Control	24	1:1,000,000	24,000,000
	2. Convalescent serum	240	1:100,000	24,000,000
	3. Antitoxin diluted 1:10	Too many	1:100,000	

with the amounts used in the tests the difference in bacteriostatic action of the serums tested was quite striking. Moore and Thalhimer [18] have demonstrated antibacterial properties in some individual convalescent serums against types 1, 3, 10 and 30.

Since the antitoxic titer of convalescent serum is known to range from only 5 to 10 units per cubic centimeter, an attempt was made to increase the antitoxic level of two recovered scarlet fever patients. These individuals were given the ordinary series of erythrogenic toxin injections used in the Dick immunization.

For purposes of comparison, samples of blood were taken before and after toxin immunization. Measurements of antitoxic immunity were carried out according to the method of the Dicks. Serum from the donors and pooled convalescent serum were compared in this way. Individuals known to be Dick positive were used in making standardizations. Each person was given injections of standard toxin-antitoxin mixtures as well as unknown serum plus standard toxin, thus permitting a comparison to be made between standard and unknown on each reactor.

The results of this experiment as summarized in table 6 indicate that the immunization of scarlet fever convalescents with erythrogenic toxin does not increase the antitoxic immunity of such individuals appreciably.

In spite of the relatively low antitoxic titer of convalescent serum, the clinical results reported by Hoyne, Levinson and Thalhimer [19] following therapeutic doses

TABLE 5.—*Dick-Positive Blood*

Hours	Tube	Count	Dilution	No. per Cc.
0	All	32	None	32
½	1. Control	0	1:3	0
	2. Convalescent serum	0	1:3	0
	3. Antitoxin diluted 1:10	(1, 0, 0)	1:3	1
1	1. Control	1	1:3	3
	2. Convalescent serum	(0, 1, 0)	1:3	1
	3. Antitoxin diluted 1:10	(2, 2, 1)	1:3	5
3	1. Control	38	1:100	3,800
	2. Convalescent serum	2	1:10	20
	3. Antitoxin diluted 1:10	30	1:100	3,000
5	1. Control	21	1:10,000	210,000
	2. Convalescent serum	3	1:1,000	3,000
	3. Antitoxin diluted 1:10	24	1:10,000	240,000
9	1. Control	126	1:1,000,000	126,000,000
	2. Convalescent serum	8	1:1,000,000	8,000,000
	3. Antitoxin diluted 1:10	154	1:1,000,000	154,000,000

of only 40 cc. compared favorably with those collected by us [17] at about the same time, following the use of commercial antitoxin in doses fifteen times as large when expressed in antitoxin neutralizing units.

These two groups of cases, listed in tables 7 and 8, were observed at about the same time in nearby midwestern cities, although they are not identical samples. The roughly similar reduction of principal complications in the two series as compared to controls suggests the possibility that factors other than antitoxic titer may explain the results obtained with human convalescent serum.

Some reports on the incidence of complications following the use of antitoxin are by no means as favorable as those tabulated.

Although relatively large doses of convalescent serum are required to match the antitoxic titer of commercial antitoxin, it is believed by some that such quantities of human serum are clinically much more effective than an equivalent amount of commercial antitoxin as expressed in antitoxic units. This is offered as further evidence that convalescent serum is antibacterial or at least that its beneficial effect is not limited to its specific

15. Chandler, Caroline A., and Hartshorn, Mildred: Studies on Possible Correlation Between Experimental and Clinical Data Concerning Response of Infection to Serum, Yale J. Biol. & Med. **5**:555 (July) 1933.

16. Burn, C. G.; Chandler, Caroline A., and Hartshorn, Mildred: Production of Streptococcus Hemolyticus Bacteremia in Nonspecifically Sensitized Animals, J. Exper. Med. **60**:1 (July) 1934.

17. Sako, Wallace; Dwan, P. F., and Platou, E. S.: Sulfanilamide and Serum in Treatment and Prophylaxis of Scarlet Fever, J. A. M. A. **113**:995 (Sept. 10) 1938.

18. Moore, Elizabeth, and Thalhimer, William: Immunologic Properties of Scarlatina Convalescent Serum, Am. J. Dis. Child. **58**:1039 (Nov.) 1939.

19. Hoyne, A. L.; Levinson, S. O., and Thalhimer, William: Convalescent Scarlet Fever Serum: Its Prophylactic and Therapeutic Value; Review of 2,875 Cases, J. A. M. A. **105**:783 (Sept. 7) 1935.

antitoxic content. Our own experience with massive intravenous doses of convalescent serum in critically ill patients suggests that this is true.

In an attempt to increase the antibacterial activity of convalescent serums, four donors who had recovered from scarlet fever were inoculated with suspensions of killed virulent streptococci. Two were of unknown type and received type 8 vaccine, while two others were types 2 and 4 respectively and were given vaccine of the homologous type.

The vaccine was prepared by suspending the centrifuged organisms from a veal-infusion broth culture so that each cubic centimeter contained approximately 200,000,000 organisms. The streptococci were killed by heating at 56 C. The convalescent donors were given 0.5 cc. of the vaccine subcutaneously and were bled on the second to the seventh day following. Comparison of the antibacterial power of the serum before and after administration of the vaccine was made in the same manner as described in the previous experiments.

It was thought that the antigenic stimulus provided by the bacterial suspension might cause an exfoliation of antibodies into the blood stream resulting in an increase in antibacterial power. Using whole blood from a Dick-positive adult as a source of phagocytes, to which samples of serum to be tested were added (as described), we were unable to demonstrate any increased antibacterial activity on the part of the donor's serum as the result of the single stimulus employed.

TABLE 6.—*Titers Before and After Immunization*

Donor	Titer Before Immunization	Titer After Immunization
Cameron.....	10 units per cc. serum	10 units per cc. serum
Marshall.....	10 units per cc. serum	10 units per cc. serum

COMMENT

From the observations of Ward and Lyons,[13] Fothergill and Lium,[20] Moore and Thalhimer [15] and from our own experiments, it appears that some individuals are deficient in their ability to produce a high degree of humoral immunity after streptococcic infection, while others are proficient. Constitutional make-up, bacterial dosage, occurrence of complications, the antigenic composition of the involved streptococcus (as revealed by Mudd [21]) and perhaps other factors are involved in the adequacy of the immunity resulting from infection. This no doubt explains the uniformity in the action of pooled serum as compared to the variability found in individual samples. If a sample of each donor's serum could be tested by opsonic study prior to its acceptance in a pool, and especially if it could be tested against a homologous type of organism, the serum resulting would be even better than the pools now dispensed by serum depots.

To avoid the necessity of obtaining cultures for typing of all donors, our laboratory is now typing serum directly, using purified M substance from known types of streptococci. Either by typing the organism responsible for the disease or by detection of type-specific antibodies in the serum itself, it is possible to pool serums known to be active according to types and thus provide undiluted type-specific antibodies. A method of treatment obviously superior to immunotransfusion and even better than pooled convalescent serum can thus be made.

An advantage to be gained by the use of any human convalescent serum is found in the ease and safety with which it can be administered. It has been shown [22] that even concentrated antibody (diphtheria antitoxin) is absorbed at a surprisingly slow rate after intramuscular administration. Clinical observations constantly emphasize the importance of early administration of serum. Some workers stress the quantitative factor in therapy but too few have dwelt on the need for a safe, rapid dissemination of antibodies which specifically combat the peculiarly widespread toxemia as well as the invasive processes of the organism. This is best achieved safely by the intravenous administration of human serum.

SUMMARY

The clinical and experimental evidence presented suggests the following points:

1. Erythrogenic toxin, produced in varying amounts by any of Griffith's thirty types of hemolytic streptococci, is important in the pathogenesis of scarlet fever and other streptococcic infections and its prompt neutralization is desirable.

2. Other toxic products of the hemolytic streptococcus, such as leukocidin, fibrinolysin, and spreading and invasive factors have received inadequate consideration.

3. The ideal antiserum for treatment of infections due to group A hemolytic streptococci (including scarlet fever) is one which is rich in both group-specific and type-specific antibodies and which is homologous.

4. Though commercial scarlet fever antitoxin has merit as a neutralizing agent against erythrogenic toxin, it lacks any antibacterial or anti-invasive properties.

5. Pooled convalescent scarlet fever serum in large doses confers considerable antitoxic immunity and in addition an effective antibacterial immunity.

6. Heterologous serum (horse) may cause reactions which can predispose to bacterial spread.

7. Attempts to increase the antitoxic titers of human convalescent donors have been unsuccessful.

8. Hyperimmunization of convalescent donors with streptococcus vaccines did not result in increased antibacterial activity under the conditions of our experiment.

9. Pooling human serums according to antibody activity and type and administration of this product intravenously offer an immunologically sound basis for the serum treatment of group A streptococcus infections.

20. Fothergill, L. D., and Lium, Rolf: Value of Commercial, Antibacterial Streptococcus Sera in Hemolytic Streptococcus Infections, New England J. Med. **211**: 99 (July 19) 1934.

21. Mudd, Stuart; Czarnetzky, E. J.; Lackman, David, and Pettit, Horace: Antigenic Structure of Hemolytic Streptococci of Lancefield Group A: Preparation of Labile, Type-Specific Antigen; Its Identification as Griffith Type-Specific Agglutinogen and as Substance from Which a Group-Specific and a Type Specific Hapten Are Derivable, J. Immunol. **34**: 117 (Feb.) 1938.

22. Platou, E. S.: Antitoxin in Diphtheria: A Comparative Study of Usual Methods of Administration with Intraperitoneal Method, Arch. Pediat. **40**: 575 (Sept.) 1923.

The Original Materials Vary.—The same soil that without water is a desert may, under irrigation, produce luxuriant vegetation. On the other hand, no matter how much we may water a rock, we shall be unable to produce a single blossom. So with human beings, the original materials vary, and conditions under which those materials develop into character and personality vary also. It requires the combination of the two, both the material and the life experiences which are called heredity and environment, to explain man as a whole.—Faegre, Marion L., and Anderson, John E.: Child Care and Training, Minneapolis, University of Minnesota Press, 1940.

A CLINICAL AND PATHOLOGIC STUDY OF ORAL DISEASE

BASED ON 2,300 CONSECUTIVE CASES

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In presenting this group of cases of oral lesions my primary intention is to give a statistical incidence of diseases and lesions that involve the oral cavity to fill in a hiatus in medical literature. In a compilation of the various groups, some comment is indicated to clarify the various conditions involving specific locations in the mouth and to dilate on some of the special diseases and some of the more recent theories accounting for oral disease.

TABLE 1.—*Gingival Lesions*

	Office	Clinic	Total
Chronic gingivitis	36	43	79
Bismuth gingivitis with pigmentation	8	56	64
Gingivitis with hyperplasia	18	40	58
Chronic Vincent's gingivitis	16	30	46
Acute Vincent's gingivitis	12	14	26
Pyorrhea alveolaris	4	10	14
Hyperplasia of gingivae (edentulous)	10	12	22
Acute gingivitis	5	13	18
Mucous patch	7	8	15
	116	226	342

The oral cavity has always been a "no man's land" as far as any group of physicians or dentists can claim a special knowledge of the multitude of lesions found in this domain. As the mouth reflects in many instances disease processes elsewhere in the body, it can well be considered the "diagnostic mirror" of the body.

No group of medical specialists is better fitted by training to lead the way in stimulating interest in diseases of the mouth than the dermatologist. The dentist, however, should by election become the diagnostician and be recognized as a stomatologist rather than one whose knowledge is confined to the teeth alone.

With this in mind a course in oral medicine or oral diagnosis was instituted in Tufts College Dental School thirteen years ago, primarily to educate the dentist to recognize lesions of the oral mucous membrane and to utilize his knowledge of dentistry in correlating and interpreting oral lesions. Similar courses are now given in dental schools all over the country and are proving valuable adjuncts to the curriculums of these institutions. With a few exceptions, no such courses are given in the medical schools in this country, and the knowledge of oral diagnosis by the medical profession is necessarily limited.

Fig. 1.—Hypertrophic stomatitis (palate); chronic irritation from denture.

Much misinformation based on insufficient scientific and clinical investigation has been given to both the medical and the dental profession, and in an attempt to "clarify" some of these "issues" this statistical and clinical study of a large group of cases is presented.

The two groups studied include, first, private cases that were referred by dentists and physicians, representing diagnostic problems and those sent for treatment, in which the diagnosis of the disease condition was obvious. The second group represents cases selected for teaching purposes, the sources of which include a large dermatologic outpatient clinic, the dental infirmary and private practice from which cases were referred to the clinic by dentists and physicians. The latter group is not as valuable in determining the incidence of oral disease as the referred and private cases seen in office practice. I have separated the two groups to help determine the incidence and have combined them for a study of etiology, clinical manifestations, pathologic conditions and treatment.

Fig. 2.—Glossitis areata migrans (geographic tongue).

GINGIVAL LESIONS

Pathologic changes in the gums are almost universal in all decades of life, particularly among the Caucasian race. Certainly as one sees the mouths of persons living under modern conditions one is impressed with the frequency of gingival disease as shown by the mild gingival inflammatory process to the more marked hypertrophic conditions and evidences of infection.

Local evidences of gingival inflammatory changes due to acute or chronic irritation from local causes such as tartar formation or irritation from faulty occlusion and artificial dental appliances account for many of the gingival lesions, but many of these cases reflect some allergic, constitutional condition, blood dyscrasia or drug reaction. There is no group of diseases of the oral cavity that remains so obscure, based on etiology, and it challenges the professions to carry on further studies to solve the many problems involved in gingival lesions.

In compiling this group, I have tried to simplify the terminology without attempting to subdivide the various groups based on etiology. A few cases have been diagnosed as pyorrhea alveolaris, but as the average dentist can readily diagnose this condition it is not referred as

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a diagnostic problem, but the etiology of the condition still baffles the medical and dental professions.

The comparatively small number of cases of Vincent's gingival infection is illuminating to most of the medical and dental professions, who are prone to make a diagnosis of this disease on insufficient knowledge. The low grade gingival type of this disease is more common than the local destructive gangrenous lesions seen in other parts of the oral cavity, such as in the tonsillar region.

TABLE 2.—*Stomatitis*

	Office	Clinic	Total
Chronic aphthous stomatitis	40	21	61
Chronic stomatitis	22	31	53
Ulcerative stomatitis	12	22	34
Acute aphthous stomatitis	13	10	23
Traumatic stomatitis	3	12	15
Stomatitis (drug lesions)	5	8	13
Chronic stomatitis (biting habit)	4	6	10
Gangrenous stomatitis (bismuth poisoning)	0	2	2
	99	112	211

After the World War twenty years ago there was a definite increase in this disease, but in recent years it has definitely become a relatively rare condition based on clinical and bacteriologic examinations.

The chronic form of Vincent's infection is often associated with hyperplastic gingival reaction, and a rich bacterial flora with the presence of Vincent's organisms can be demonstrated under the gingival tabs. This condition is frequently prolonged by overtreatment from repeated medication with irritating and stimulating chemicals.

The classification of gingival lesions, subdivisions such as the allergic group and those related to constitutional disease is avoided, as specific reactions are difficult to demonstrate based on our present knowledge of gingival lesions.

The relatively high percentage of gingivitis with pigmentation due to bismuth in the clinic group is due to a special study of these cases which has been previously reported.[1]

STOMATITIS

In classifying the various types of stomatitis it is necessary to consider the regional distribution of the inflammatory process as well as the mouth as a whole. Again, in a statistical study of this kind one must group certain processes under one heading, as a detailed subdivision is not practicable. The rarity of stomatitis venenata in contrast to the frequency of dermatitis venenata will be noted.[2] This is undoubtedly due to the length of contact of the offending irritant, the natural resistance of the buccal mucosa, the unusually good blood supply, and unknown factors that cause the tissues of the mouth to be resistant to external irritants of all kinds.

Fig. 3.—Syphilitic atrophic glossitis with leukoplakia.

Galvanism as a cause of local stomatologic lesions has been discussed in the literature for the past decade.[3] In this study I am not ready to accept oral galvanism as a factor in the production of lesions of the oral mucosa. It is my belief that lesions which have been attributed to electric currents can be explained by local irritative factors and other causes.

Fig. 4.—Leukoplakia buccalis (grade 4 verrucous carcinoma).

TONGUE LESIONS

Books have been written on diseases of the tongue independent of the oral cavity[4] as a whole, and this classification of tongue lesions is simplified. It will be noted that the diseases lingua nigra and glossitis rhombia mediana are extremely rare conditions as compared with the irritative lesions from local irritative conditions.

I have been especially interested in the development of the tertiary syphilitic lesions of the tongue commonly referred to as the "bald tongue" of syphilis. The mechanism of the production of this particular lesion may be explained by a sequence of pathologic changes, each in turn related to the preceding pathologic tissue reaction. The tongue, a mobile organ subject to mild trauma, receives a heavy dose of spirochetes in the secondary stage, and if the disease is untreated or inadequately treated endarteritis of the smaller vessels results. Later, owing to the interstitial sclerosing process together with the resulting decrease in the blood supply to the highly specialized end organs, the papillae undergo atrophy with the production of smooth, bald areas on the surface of the tongue. These areas are somewhat patchy, and subsequently a leukoplakia develops usually as the result of irritation from the products of combustion and heat in smokers. The leukoplakic lesions may later develop into true malignant growths, which explains the high incidence of carcinoma of the tongue in syphilitic glossitis.

1. McCarthy, F. P., and Dexter, S. O.: Oral Manifestations of Bismuth, New England J. Med. **213**: 345-352 (Aug. 22) 1935.

2. Loveman, A. B.: Stomatitis Venenata: Report of a Case of Sensitivity of the Mucous Membranes and the Skin to Oil of Anise, Arch. Dermat. & Syph. **37**: 70-81 (Jan.) 1938.

3. Lain, E. S.: Lesions of the Oral Cavity Caused by Physical and by Physicochemical Factors, Arch. Dermat. & Syph. **41**: 295-305 (Feb.) 1940. Reinhard, M. A.; Solomon, H. A., and Goltz, H. L.: Further Experiments in Oral Galvanism, J. Am. Dent. A. **26**: 1846-1848 (Nov.) 1939.

4. Spencer, W. G., and Cade, Stanford: Diseases of the Tongue, Philadelphia, P. Blakiston's Son & Co., 1931.

LIP LESIONS

Lip lesions are fairly common, as indicated by the percentage in this group, but there are a large number of patients with herpetic lesions and local inflammatory processes of a transient nature who do not consult medical or dental practitioners. If these were included, the relative percentage of cases involving the lips would

Fig. 5.—Leukoplakia of tongue (grade 4).

be materially increased. Note the small number of cases of cheilitis venenata, indicating that lipsticks of various kinds are chemically inert.

NEOPLASMS AND CYSTS

One will note that the oral cavity is invaded by a large group of neoplasms, both benign and malignant. Except for the rare transitional cell carcinoma at the

TABLE 3.—*Tongue Lesions*

	Office	Clinic	Total
Glossitis areata migrans (geographic tongue)	19	36	55
Congenital fissured tongue	14	36	50
Syphilis of tongue:			
Chancre	2	2	4
Mucous patch	4	6	10
Gumma of tongue	4	2	6
Lingua lobulata	1	1	2
Atrophic syphilitic glossitis	9	36	45
Chronic glossitis	20	41	61
Atrophic glossitis (secondary anemia)	18	14	32
Atrophic glossitis (pernicious anemia)	5	3	8
Tuberculosis of tongue	2	2	4
Ulcerative glossitis	11	9	20
Papillitis	14	34	48
Glossodynia	6	10	16
Lingua nigra (hairy tongue)	4	5	9
Pseudo-hairy tongue	0	2	2
Glossitis rhombia mediana	3	2	5
Traumatic glossitis	1	5	6
Macroglossia	1	0	1
Varicosities	2	10	12
	140	256	396

base of the tongue and the rarer adamantine epithelioma, the malignant tumor of the oral cavity is the squamous cell carcinoma. The role of leukoplakia as a forerunner of cancer cannot be determined by this statistical study, but it can be stated that carcinoma frequently arises from the leukoplakic lesion found in syphilitic atrophic glossitis. There are many different types of epulides if one wishes to use the refinements in differentiation of the cellular structure, but in order to simplify the picture these gingival lesions have been classified into three groups.

The fibromas outnumber any single type of benign tumor, as many tabs of mucosa and fibrosed pedunculated mucous cysts are included in this group.

Mucous retention cysts are rather common oral lesions and are found more frequently on the lower lip and buccal mucosa in relation to the line of occlusion. This can be explained by the importance of trauma as the etiologic factor causing injury to the excretory duct with resulting fibrosis and stricture of the duct.

TABLE 4.—*Lip Lesions*

	Office	Clinic	Total
Chronic cheilitis	13	21	34
Intertrigo labialis	7	13	20
Cheilitis exfoliativa	9	6	15
Cheilitis glandularis (apostematosa)	7	6	13
Cheilitis venenata	5	3	8
Fissure of lip	2	6	8
Chronic lymphangitis	3	2	5
Chancre of lip	2	3	5
	48	60	108

A high percentage of the submaxillary and sublingual gland cysts (ranula) were associated with calculus either in the main duct or in branches in the parenchyma of the salivary glands.

DERMATOSES

The unusually large percentage of oral lichen planus without cutaneous manifestations is what one would expect in a clinic confined to oral disease. There is considerable difficulty in definitely making this diagnosis in the absence of the characteristic cutaneous lesions, and biopsy specimens are useful in substantiating this diagnosis. Again, oral erythema multiforme without cutaneous lesions may be difficult to differentiate from aphthous stomatitis. The dermatologist again is best fitted to recognize these lesions, although many of the younger dentists have become familiar with these lesions associated with cutaneous diseases.

Fig. 6.—Section of adenoma of palate under low power magnification.

Contrary to the general impression, lupus erythematosus lesions in the oral cavity are not rare. There can frequently be observed small, asymptomatic lesions involving the buccal mucosa of the cheeks in relation

to areas subject to trauma. There may be a close clinical resemblance between oral lupus erythematosus, erosive leukoplakia and the plaque type of lichen planus. A definite differentiation of these conditions can be determined only by a study of biopsy specimens.

The dermatoses characterized by vesicular and bullous lesions in the oral cavity include aphthous stomatitis, herpes buccalis, recurrent erythema multiforme, oral pemphigus and drug eruptions. Many of these cases present a problem in therapeutics, and investigation of the etiologic factors may furnish the clue in the control of the disease condition.

TABLE 5.—*Neoplasms and Cysts*

	Office	Clinic	Total	
Squamous cell carcinoma:			116	116
Buccal mucosa	10	18		
Lip	14	20		
Palate	3	2		
Floor of mouth	5	4		
Gingivae	5	4		
Tongue	11	18		
	48	70		
Epulides:			74	74
Fibrous	18	24		
Granulomatous	12	14		
Giant cell	4	2		
	34	40		
Acanthoma	8	4	12	12
Fibromas:			73	73
Tongue	10	14		
Buccal mucosa	8	6		
Lip	6	12		
Gingivae	2	4		
Palate	4	7		
	30	43		
Hemangiomas	9	12	21	21
Lymphangiomas	2	1	3	3
Granuloma	2	4	6	..
Granuloma pyogenicum	2	1	3	..
Adamantinoma	1	0	1	..
Fibro-angioma	1	0	1	..
Mixed tumors	1	0	1	..
Papilloma	4	6	10	..
Osteomas	0	2	2	..
	27	28	48	48
Cysts				
Ranula	21	24	45	45
Mucous cysts:			90	90
Tongue	5	8		
Lip	28	35		
Buccal mucosa	8	14		
	41	57		
Embryonal cyst	1	1	2	2
	63	82	145	470

TABLE 6.—*Dermatoses*

	Office	Clinic	Total
Lichen planus (oral)	12	14	26
Lichen planus (oral and skin)	4	10	14
Pemphigus vegetans	5	4	9
Oral pemphigus	2	0	2
Angioneurotic edema	10	4	14
Lupus erythematosus	9	15	24
Erythema multiforme	10	12	22
Herpes labialis	6	14	20
Herpes buccalis recurrent	4	3	7
Purpura haemorrhagica	2	4	6
Lupus vulgaris	0	1	1
Herpes buccalis	2	4	6
	66	85	151

BLOOD DYSCRASIAS AND CONSTITUTIONAL DISEASES

The color of the oral mucosa in the anemias is distinctive in cases of severe involvement, and the associated atrophy of the tongue in cases of pernicious anemia and of severe secondary involvement is well known.

Bleeding from the gums with superficial erosive lesions in cases of anemia, granulocytopenia and acute leukemia may give the first clue to these conditions. The hypertrophic gingival reaction in the more chronic forms of leukemia, particularly the myelogenous type, is particularly diagnostic and again may give the clue to the disease.

Fig. 7.—Lichen planus dendritic lesions of buccal mucosa.

Frequently the oral cavity shows changes, especially in the deficiency diseases, so called, with avitaminosis. Pellagra shows rather typical tongue lesions in the advanced cases and recently vitamin B_2 (riboflavin) deficiency has been shown to manifest lip and intertriginous lesions at the external commissures.[5] One must not be carried away by literature dealing with the avitaminotic conditions and arrive at hasty conclusions before first ruling out the more common causes of oral lesions.

DRUG ERUPTIONS IN THE ORAL CAVITY

In the large group of cases in which drug eruptions occurred in the oral cavity only a few were definitely determined to present a relation to ingestion or absorption of drugs. Among the drugs capable of producing lesions in the oral cavity are phenolphthalein, the barbiturates, the iodides and dilantin sodium. The last named drug, used in the treatment of epilepsy, is responsible for a remarkable gingival hyperplastic reaction in up to 50 per cent of patients taking the drug for any considerable period of time. In cases showing a deficiency in vitamin C along with taking the drug, the gingival reactions are earlier and more pronounced.[6]

Fig. 8.—Lichen planus of tongue, plaque type.

With the present use of the barbiturates, the various sulfanilamide preparations and dilantin sodium in epilepsy, it is to be expected that oral lesions due to these drugs will definitely increase in number.

5. Jolliffe, Norman; Fein, H. D., and Rosenblum, L. A.: Riboflavin Deficiency in Man, New England J. Med. 223:921-926 (Dec. 14) 1939.
6. Frankel, S. I.: Dilantin Sodium in Epilepsy, J. A. M. A. 114:1320-1321 (April 6) 1940.

LEUKOPLAKIA BUCCALIS

In a previous article a group of 316 cases of leukoplakia based on the etiologic factors with a clinical and pathologic gradation were reported.[7] Since that time many more cases have been added, and investigations on the value of estrogenic substances in the treatment of the conditions are under consideration. The recent literature[8] suggesting hormonal deficiencies as an etiologic factor and the application of therapy based on this assumption is not conclusive.

Table 7.—*Manifestations of Blood Dyscrasias and Constitutional Diseases*

	Office	Clinic	Total
Atrophic glossitis—secondary anemia	18	14	32
Atrophic glossitis—pernicious anemia	5	3	8
Acute gingivitis—aplastic anemia	2	1	3
Hypertrophic gingivitis—monocytic anemia	2	1	3
Hypertrophic gingivitis—chronic myelogenous	1	1	2
Acute gingivitis	1	1	2
Tonsillitis with ulcerative glossitis (tuberculosis)	2	2	4
Tuberculosis cutis orificialis	1	0	1
Pellagra	1	3	4
Chronic gingivitis (diabetic)	2	3	5
Chronic atrophic glossitis (avitaminosis)	2	4	6
	37	33	70

Table 8.—*Drug Groups*

	Office	Clinic	Total
Phenolphthalein			
Bullous stomatitis	1	2	3
Barbiturates			
Vesicular eruption	2	3	5
Dilantin sodium			
Hyperplastic gingivae	1	3	4
Potassium iodide			
Vesicular eruption	1	0	1
	5	8	13

Fig. 9.—Hyperplasia of gums (dilantin sodium therapy for epilepsy).

Leukoplakia is by far the most common oral mucous membrane lesion, and since the condition is definitely a premalignant hyperkeratotic lesion one cannot overemphasize the importance of handling these cases.

Fig. 10.—Fordyce's disease (granules of buccal mucosa).

SPECIAL AND MISCELLANEOUS LESIONS

It is not necessary to discuss this particular group, as table 10 indicates the numerical incidence of the various types. The incidence of torus palatinus as shown in this group is undoubtedly lower than the actual incidence, as only the very pronounced cases were recorded. Fordyce's disease, so called, is a common condition and is essentially a normal finding. Only the more noticeable cases are included in this group. Only a small number of patients visit a physician or dentist to seek relief of symptoms caused by these lesions.

These secreting glandular lesions may cause disagreeable symptoms of the lips owing to excessive secretory activity.

Table 9.—*Leukoplakia Buccalis*

Office	Clinic	Total
118	204	322

Table 10.—*Miscellaneous Lesions*

	Office	Clinic	Total
Cancerophobia	43	29	72
Fordyce's disease	5	41	46
Vincent's infection (tonsil)	2	2	4
Neuralgia	4	8	12
Torus palatinus	3	5	8
Exostoses	3	4	7
Chancre of tonsil	1	0	1
Chancre of buccal mucosa	1	0	1
Alveolar abscess	7	6	13
Absence of enamel	2	0	2
Mottled enamel	0	2	2
Xerostomia	1	1	2
Parotitis	1	4	5
Osteomyelitis	1	1	2
Syphilophobia	2	0	2
Hemophilia	1	0	1
Calculi (gingival)	3	2	5
Alae gingivae	1	1	2
Ptyalism	5	2	7
Abscess of palate	3	0	3
Sinusitis	1	4	5
Periche	0	3	3
Abscess of cheek	0	2	2
Argyria	0	1	1
Cervical adenitis	1	6	7
Cleft palate	3	0	3
	94	124	218

7. McCarthy, F. P.: Etiology, Pathology and Treatment of Leukoplakia Buccalis, Arch. Dermat. & Syph. 34: 612-623 (Oct.) 1936.
8. Nathanson, I. T., and Weisberger, D. B.: The Treatment of Leukoplakia Buccalis and Related Lesions with Estrogenic Hormone, New England J. Med. 223: 556-566 (Oct. 12) 1939.

HISTOPATHOLOGY OF ORAL LESIONS

The histopathology of oral lesions is essentially the same as that of lesions which involve the skin. Some variations in the microscopic picture, based on the absence of hair follicles, sudoriferous and sebaceous glands, may be expected, and changes involving the serous and mucous glands present distinctive problems.

Study of the biopsy specimens of the various tumors, infectious granulomas, pigmentary lesions, mycosis fungoides, scleroderma, amyloidosis and some of the

TABLE 11.—*Summary*

	Office	Per Cent	Clinic	Per Cent	Total	Per Cent
1. Neoplasms and cysts	204	22.0	266	19.3	470	20.4
2. Tongue lesions	140	15.1	256	19.0	396	17.2
3. Gingival lesions	116	13.0	226	16.4	342	14.8
4. Leukoplakia buccalis	118	13.0	204	14.8	322	14.0
5. Miscellaneous and special lesions	94	10.1	124	9.0	218	9.5
6. Stomatitis	19	11.0	112	8.1	211	9.1
7. Dermatoses	66	7.1	85	6.2	151	6.5
8. Lip lesions	48	5.1	60	4.3	108	4.6
9. Blood dyscrasias and constitutional diseases	37	4.0	33	2.4	70	3.0
10. Drug manifestations	5	0.5	8	0.6	13	0.6
	927		1,374		2,301	

dermatoses, including lichen planus and lupus erythematosus, can be expected to offer diagnostic information in connection with clinical manifestations.

COMMENT

Local irritation due to faulty occlusion, artificial dental appliances and dentures is definitely the important factor in the production of focal oral lesions. The physician or dentist must be very thorough in the examination of the oral cavity to rule out these local factors before considering the rarer causes of oral disease.

Fig. 11.—Section through Fordyce's granule, showing sebaceous glands.

It is important to recognize the endogenous factors causing oral disease, especially the gingival lesions, the symmetrical vesicular eruptions, the manifestations of systemic disease, the various drug preparations and the dermatoses.

Just how frequently allergic reactions of the buccal mucosa occur is still debatable, but there is some evidence to indicate that acute and chronic gingival lesions have an allergic basis.

CONCLUSIONS

1. Leukoplakia buccalis represents the most frequent and important lesion of the oral cavity.

2. Vincent's infection is on the decrease and now can be classified as an uncommon oral condition.

3. Gingival lesions are the least understood of all oral lesions, and there is opportunity for considerable research to clarify the etiologic factors.

4. Dilantin sodium, a new drug used in the treatment of epilepsy, is a cause of a severe form of hyperplastic gingivitis.

5. Stomatology should be an important subject in both dental and medical curriculums.

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ABSTRACT OF DISCUSSION

DR. FRANK J. EICHENLAUB, Washington, D. C.: Dr. McCarthy is to be congratulated for reemphasizing the importance of examination of the mouth. It is impossible to argue with the type of statistics he has presented. Probably many dermatologists are overlooking mouth lesions, and that is why we don't see as many as he has. In the routine admission of patients to the Veterans Hospital in Washington we examined the mouths of 6,468 consecutive patients. Among these were 2,330 cases of dermatoses of various kinds and 233 cases which presented lesions of the mouth, divided as follows: tuberculosis of the tongue, 12; cheilitis glandularis apostematosa, 4; geographic tongue, 21; leukoplakia, 187; monilia of the tongue, 6; torus palatinus, 2, and hairy tongue, 1. In a routine examination of this kind, patients going through from all over the eastern United States and not especially sent in either for skin disease or mouth lesions, most of the mucous membrane lesions were not encountered.

DR. SAMUEL AYRES Jr., Los Angeles: I would like to get Dr. McCarthy's opinion regarding the treatment of oral lichen planus, which is one of the most troublesome therapeutic problems in the mouth. I have pretty near gotten to the point of not encouraging patients to undertake treatment for it. In a few instances I have secured more or less complete results with combinations of superficial roentgen therapy, mercuric salicylarsenate and bismuth compounds; but my experience has been quite unsatisfactory. I would be interested to hear whether Dr. McCarthy has anything better to offer.

DR. FRANCIS P. MCCARTHY, Boston: I hoped that there would be more discussion, but I assume that the lack of it is based on the fact that the dermatologist does not examine the mouth as a routine procedure. To obtain clinical material for teaching purposes in a clinic for oral diagnosis, I have become "mouth minded" and plan to examine the oral cavity of about every patient. In the prevention of carcinoma of the mouth I wish to emphasize the value of making patients edentulous as a preventive measure, especially in the male beyond middle life who tends to neglect the teeth and who is a heavy smoker, because it is in this type of case that carcinoma is more prevalent. The edentulous mouth rarely develops a malignant growth even if the individual still continues to be a heavy user of tobacco. With regard to the treatment of oral lichen planus, there is no specific treatment other than the use of mercuric salicylarsenate, the various bismuth preparations, and superficial roentgen therapy. I believe that certain local irritating factors in the mouth, including bridge work and carious teeth, which tend to traumatize the mucous membrane, may be the activating irritants in perpetuating the lesions of lichen planus. I have seen cases of lichen planus with extensive involvement of the oral cavity rapidly disappear in a matter of days or weeks without any form of treatment.

CARCINOMA OF THE STOMACH

WITH PARTICULAR REFERENCE TO THE SIGNIFICANCE OF PERSISTENT SYMPTOMS ASCRIBED TO THE STOMACH AND THE MALIGNANT POTENTIALITY OF GASTRIC ULCERS

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ROCHESTER, MINN.

The seriousness of cancer of the stomach may be emphasized by consideration of the three major causes of death enumerated by Livingston and Pack [1] in a study of end results in the treatment of gastric cancer. These authors have pointed out the fact that our nation has engaged in six major wars since 1776 which extended over a total period of fifteen years. In these fifteen years of war 244,357 American soldiers were killed in action or died of wounds received in action. During the fifteen years of peace, 1923 to 1937 inclusive, 441,912 persons died from injuries received on the highways of the United States. On the basis of 40,000 deaths a year from cancer of the stomach, as determined from figures furnished to Livingston and Pack by the American Society for the Control of Cancer, the total deaths in the United States from cancer of the stomach for a fifteen year period would be 600,000. Nearly two and a half times as many persons died from cancer of the stomach as were killed in all the major wars in which the United States has been involved.

Fig. 1.—Gastric ulcer: *a*, Oct. 8, 1937; ulcer 1.5 cm. in diameter on the lesser curvature at the angle of the stomach; *b*, Nov. 2, 1937; ulcer still present, but with a smaller crater.

In the light of present knowledge, only the surgeon can offer a patient afflicted with malignant disease of the stomach the possibility of permanent relief, for early removal of the malignant growth is the only known method of cure. Unfortunately, however, a lamentable disregard of the significance of persistent symptoms referable to the stomach persists among laymen and many members of the medical profession. There is also an equally deplorable tendency to await the development of typical symptoms ascribed in textbooks to malignant gastric lesions before serious consideration is given to the possibility that a malignant lesion of the stomach exists.

Because of variations in the location and pathogenesis and because of the dissimilarity of the types of malignant lesions of the stomach, the clinical picture of necessity must be inconsistent; often it is vague and ill defined. The late Sir Berkeley Moynihan [2] was impressed by four clinical types of carcinoma of the stomach. In the first and largest group, the symptoms mimicked those of duodenal ulcer but usually the intervals of remission were absent. In the next largest group vague dyspepsia occurred for a varying length of time. Early symptoms of obstruction or hemorrhage as an initial symptom characterized the other two groups. In 24.7 per cent of 287 cases studied by Saltzstein and Sandweiss [3] in which death occurred from malignant disease of the stomach, long-continued indigestion was the prominent feature and in a third of these a typical history of ulcer was obtainable. That half of the patients had been under medical care for ulcer is noteworthy. In a previous article I [4] mentioned that two distinct clinical groups can be recognized easily. In approximately 75 per cent of the 373 cases of carcinoma of the stomach included in my study there were persistent and unchanged symptoms referable to the stomach and in a fourth of this subgroup the symptoms had been present for more than a year. In 25 per cent of the 373 cases, symptoms referable to the stomach had been present for varying lengths of time but the symptoms had changed recently. The earlier symptoms in this group were similar in most respects to those in the first group mentioned. The symptoms noted recently for the first time consisted in most instances of obstructive features, hemorrhage, rapid loss of weight, anorexia or other features suggestive of a large tumor. These, unfortunately, are the symptoms that many physicians await before insisting that the patient shall undergo complete investigation with the object of settling the diagnosis.

Latent carcinoma of the stomach, fortunately, is relatively rare; only infrequently will this condition be present. When no symptoms are present, usually nothing can be accomplished, for the disease will be discovered only after death or after the involvement of some distant organ.

One of the reasons why so many physicians await a syndrome characteristic of malignant disease of the stomach before suspecting the presence of a malignant lesion is the impression obtained from some of the widely used textbooks of medicine. In these, "progressive emaciation" has been mentioned as "one of the most constant features," "loss of strength has been found to be proportionate to the loss in weight" and anemia

From the Division of Surgery, the Mayo Clinic.

Read before the Section on Surgery, General and Abdominal, at the Ninety-First Annual Session of the American Medical Association, New York, June 13, 1940.

1. Livingston, E. M., and Pack, G. T.: End Results in the Treatment of Gastric Cancer: An Analytical Study and Statistical Survey of Sixty Years of Surgical Treatment, New York, Paul B. Hoeber, Inc., 1939.

2. Moynihan, Berkeley: Cancer of the Stomach, Practitioner **121**: 137-148 (Sept.) 1928.

3. Saltzstein, H. C., and Sandweiss, D. J.: The Problem of Cancer of the Stomach, Arch. Surg. **21**: 113-127 (July) 1930.

4. Gray, H. K.: The Clinical and Pathological Factors Influencing the Ultimate Prognosis Following Resection for Carcinoma of the Stomach, Ann. Surg. **97**: 882-888 (June) 1933.

is "present in a large proportion of all cases." To illustrate in how large a proportion of the cases a tumor is in evidence when a diagnosis of carcinoma of the stomach was made, one investigator mentioned that in 115 of 150 cases a tumor could be felt. It is obvious that such a description of the "general features" of carcinoma of the stomach is that of advanced carcinoma, and in the vast majority of instances the growth in such cases will have progressed to the point of inoperability.

It is the duty of members of the medical profession to impress on the general public and on their medical colleagues the necessity of seeking medical advice for any digestive disturbance, no matter how vague. If this digestive disturbance does not respond immediately to the usual measures or requires continued treatment for relief, it is the duty of the attending physician to insist on complete investigation in order that the diagnosis may be settled. It should be emphasized again that there is no syndrome characteristic of malignant disease of the stomach. The familiar picture of carcinoma is that of an advanced stage and, if the patient is to receive the greatest benefit from surgical removal of the malignant process, the disease must be recognized before the characteristic signs are present.

MALIGNANT POTENTIALITY OF GASTRIC ULCER

A second factor which plays an important role in the maintenance of a discouragingly low rate of operability for carcinoma of the stomach is a widespread lack of appreciation of the malignant potentiality of a gastric ulcer. This does not mean that carcinoma of the stomach develops from gastric ulcer, although in some cases there is ample evidence from clinical and pathologic standpoints to support such a view. Bloodgood [5] has said that "ulcer prevention and ulcer cure are part of cancer prevention and cancer cure." To attempt to debate this problem is outside the scope of this paper. There is agreement on two points: 1. A chronic gastric ulcer may become malignant. 2. It is impossible clinically and roentgenologically to distinguish positively simple gastric ulcer from early carcinomatous ulcer.

Eusterman and Balfour [6] have stated that "there is as yet no single sign, or any combination of signs, which will determine with absolute certainty whether or not a gastric ulcer is malignant." With this extremely important question to answer accurately, what has been the usual method followed? For approximately three fourths of the patients with gastric ulcer observed for the first time the clinicians at the Mayo Clinic have advised operation. The remaining fourth have been placed on a rigid medical regimen, preferably in a hospital or sanatorium. The disappearance of pain and tenderness, of gross and occult bleeding if once present, and of the niche has been noted by Eusterman and Balfour as the criteria of healing. That such a criterion will prove accurate in the majority of cases is not doubted. That the niche occasionally may decrease in size or disappear even in the presence of malignant change is not generally known and it is this fact that should be emphasized.

A report of an illustrative case follows:

REPORT OF CASE

An unmarried man aged 37 registered for the first time at the Mayo Clinic on Oct. 7, 1937. Eight months prior to his admission, his appendix had been removed elsewhere for backache and epigastric pain which occurred two to three hours after meals. The pain had continued without relief for three months, when he began to have nausea and vomiting. The vomitus contained food he had eaten two or three meals previously. Cholecystectomy was performed elsewhere without relief. The pain was relieved, however, almost immediately after the ingestion of milk.

Roentgenologic examination of the stomach at the clinic on October 8 revealed a gastric ulcer 1.5 cm. in diameter on the lesser curvature at the angle of the stomach (fig. 1 *a*). Examination of the gastric contents revealed 64 units of total acid and 52 units of free hydrochloric acid. Because the age of the patient and degree of acidity were indicative of a benign lesion, the patient was hospitalized and a rigid medical regimen was instituted. Two weeks later, October 23, the crater of the ulcer had diminished in size and was then about 1 cm. in diameter. Coincident with the improvement as revealed by the roentgenogram, the patient enjoyed remarkable subjective improvement. He was reexamined ten days later (November 2), when it was observed that the ulcer was still present but that the crater was said to be smaller than at the time of the last observation (fig. 1 *b*). The patient was dismissed with instructions to return at the end of two months for further examination and to follow a rigid ambulatory regimen about which he had been carefully instructed.

Fig. 2.—Ulcer on the lesser curvature of the stomach: *a*, June 14, 1938; note penetrating ulcer about 1.5 cm. in diameter at the angle of the stomach with considerable surrounding induration; *b*, March 8, 1939; large ulcer above the angle of the stomach.

When the patient returned on December 27, he reported that he had been doing well. He had not had gastric pain, but pain about both shoulders had been somewhat disabling. Roentgenologic examination revealed a crater that was about the same size as at the last examination, and in addition there was a duodenal ulcer. The patient was allowed to continue the conservative treatment and he was instructed to return in one month for another examination. However, he did not return until six months later, June 13, 1938. At this time all his old symptoms had recurred and on roentgenologic examination a penetrating ulcer, about 1.5 cm. in diameter with con-

5. Bloodgood, J. C.: Tumors of Stomach, in Lewis, Dean: Practice of Surgery, Hagerstown, Md., W. F. Prior Company, Inc., 1929, vol. 6, chapter 8, pp. 1-107.

6. Eusterman, G. B., and Balfour, D. C.: The Stomach and Duodenum, Philadelphia, W. B. Saunders Company, 1935, pp. 453, 457-462.

siderable surrounding induration (fig. 2*a*), was visualized on the lesser curvature at the angle of the stomach. Total acids at that time measured 66 units and there were 56 units of free hydrochloric acid in the gastric contents. Because of the recurrence or reactivation of the gastric ulcer in spite of rigid medical management, operation was advised and refused.

Nine months later the patient reappeared for examination. Roentgenologic examination demonstrated a rather large ulcer on the lesser curvature above the angle of the stomach (fig. 2*b*). There were 60 units of total acid present in the gastric contents and 44 units of free hydrochloric acid.

At operation on March 11, 1939, exposure was made through a primary midline incision in the upper part of the abdomen and a large ulcerating process was revealed on the lesser curvature of the stomach near the angle. Marked induration was associated with this lesion, which extended along the lesser curvature and into the gastrohepatic omentum as far as the insertion of the esophagus. A lymph node near the insertion of the esophagus was removed and sent to the pathologic laboratory for microscopic examination. This was found to be adenocarcinoma grade 3 (on a grading basis of 1 to 4). Because of the extension of the malignant process, the growth was considered inoperable and the wound was closed as an exploration. The patient was sent home eighteen days later and died two months after operation.

COMMENT

Did the gastric ulcer that was first visualized nearly two years before the death of this patient undergo a malignant change? Was the ulcerating process malignant from its beginning? Was the malignant process entirely independent of the gastric ulcer and a coincidental lesion? Unequivocal answers to these questions are impossible to obtain. It should be stressed again that the exact nature of an ulcerating lesion of the stomach can be obtained only by means of microscopic examination. This being so, the burden of the responsibility rests on the shoulders of the person who fails to recognize the malignant potentialty of a gastric ulcer in spite of its appearance on roentgenologic and gastroscopic examination, in spite of the age of the patient, the characteristic history of a benign lesion, the presence of appreciable quantities of free hydrochloric acid in the gastric contents, and particularly, as is so vividly illustrated by this case, in spite of improvement in the appearance of the lesion when observed repeatedly by an expert roentgenologist. The case reported herein is representative of an appreciable number of cases in my experience within recent months.

SUMMARY AND CONCLUSIONS

The significance of carcinoma of the stomach has been emphasized by Livingston and Pack, who noted that nearly two and a half times as many persons died from cancer of the stomach in fifteen years of peace as were killed outright or died as a result of wounds received during fifteen years in which the United States has been at war. It is important to consider the possibility of carcinoma of the stomach particularly when symptoms referable to the stomach do not subside and disappear after the administration of simple remedies. Furthermore, it should be remembered that there is no syndrome characteristic of malignant disease of the stomach. The widespread impression that a gastric ulcer cannot be malignant if improvement occurs which is verified by observation at intervals by a competent roentgenologist is false.

The malignant potentiality of any ulcerating lesion of the stomach should be recognized.

ABSTRACT OF DISCUSSION

Dr. Alton Ochsner, New Orleans: Physicians have been too much in the habit of thinking of carcinoma as expressed in late manifestations. Dr. Gray has emphasized the importance of the early manifestations. I would emphasize the fact that frequently the symptoms are not referable to the stomach. In our clinic we have seen six patients who had been admitted to the hospital with inoperable carcinoma who in periods of time varying from six to fourteen months previously have had an appendectomy done through a small buttonhole incision. These patients had the same symptoms at the time the appendectomy was done, that is, at the time they were admitted to the hospital; in other words, they had their carcinoma at the time the appendectomy was done. This disease, which occurs as frequently as it does (in 2 per cent of autopsies at the Charity Hospital there was a carcinoma of the stomach), should be operated on earlier. The one case which Dr. Gray mentioned is interesting. Dr. Julius Bauer has studied 200 or 300 of these patients with carcinoma of the stomach. He has followed their family histories and found that patients with carcinoma of the stomach have relations who have either benign peptic ulcers or gastric carcinoma indicating a congenital predisposition to gastric lesions. Dr. Bauer has come to the conclusion that a patient with an ulcer who has a history of ulcers in his family has so great a possibility of developing cancer that a gastric resection should be done even though, as far as one can determine, the lesion is benign. I asked Dr. Gray whether he knew anything about the family history in his case, and he stated that there was no history of cancer in the family but that he did not know whether there was any history of gastric ulcer. We have been rather negligent in getting the family histories concerning a benign lesion, and I think possibly Julius Bauer's suggestion may be of great value.

Dr. W. Barclay Parsons, New York: Variations of that tragic case reported by Dr. Gray are far too common in all our larger hospitals. Whether or not cancer develops on ulcer is a point of great academic interest. It is of far greater practical importance, however, that any patient with a gastric ulcer should be suspected of having carcinoma. That is the first point. The second point is that with many smaller gastric lesions the gastroscope in the past few years has proved an instrument of real value. The third point I want to make is that patients with gastric ulcer should be hospitalized and should be observed frequently radiographically. All of us have been at fault in examining a patient, having a roentgenogram made, putting him on an ulcer diet, having another roentgenogram made and then letting the patient go home to come back in two or three months. But the patient doesn't come back or he is back in the hospital or some other hospital with inoperable carcinoma of the stomach. The incidence of those cases is not great, it is not a large number, but they are certainly important and it is a group large enough to subject the patients who have only a simple gastric ulcer to the more rigid regimen. One should insist on complete healing, as far as one can tell by roentgen evidence, and if one can check that with gastroscopic examination one will avoid a large number of cases of unrecognized early carcinoma of the stomach.

Dr. Howard K. Gray, Rochester, Minn.: I regret that Dr. Finney could not be here, for no one in our time has contributed more than he to the subject of surgery of the stomach. Dr. Ochsner mentioned the question of symptoms referable to other organs and it reminded me of an extremely important symptom which must be recognized as being possibly associated with a malignant lesion of the stomach. This symptom is secondary anemia. If the cause of any type of anemia cannot be determined, the physician or surgeon should examine the patient carefully for the presence of a malignant lesion of the stomach. I was not familiar with Dr. Bauer's finding of a family history of gastric ulcer in patients suffering from cancer of the stomach. I believe that Dr. Ochsner's suggestion that we inquire more definitely into this question is an excellent one, and that if such a course was followed it would give some valuable information. Dr. Parsons' question has raised in my

mind an important point that I should like to stress, and that is this: Approximately 9 per cent of malignant ulcers of the stomach are diagnosed by competent roentgenologists as being benign. Competent roentgenologists will admit that it is impossible in many instances to make a definite distinction between a malignant ulcer and a benign ulcer. We know that the gastroscopist cannot tell us definitely, and neither can the pathologist tell us, even when he has the opportunity to make a gross examination of the tissue, whether or not a specified lesion is malignant. Therefore one is expecting too much of the clinician to ask him to answer definitely this extremely important question. The question naturally would arise: Why will a malignant ulcer show evidence of apparent improvement in healing under the observation of competent roentgenologists? Schindler has shown that the malignant process may fill in the crater of the ulcer and almost completely obliterate the deformity observed in the roentgenogram. There are also other artefacts that might contribute to a false roentgenologic appearance of healing. Food particles may be caught in the crater or overlapping of the opaque shadow may have taken place or material may be contained in the retrogastric portion of the duodenum behind the ulcerating lesion, all of which might confuse the roentgenologist in his interpretation of that shadow.

CHROMOBLASTOMYCOSIS

REPORT OF THE SIXTH CASE FROM CONTINENTAL UNITED STATES

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Chromoblastomycosis is a fungous disease which, although rare, is worldwide in distribution. Five cases have been reported in continental United States. One of these, the first case recorded in medical literature, was reported in 1915 by Medlar [1] and Lane [2] from Boston, and the etiologic agent was named Phialophora verrucosa. The second case [3] in continental United States (which was from Texas) and the fourth [4] (from St. Louis) were also caused by this fungus. The third case [5] from this continent was reported from North Carolina. That case, the fifth [6] (from Philadelphia) and the sixth, which we are now reporting from Atlanta, Ga., were caused by a related fungus which Brumpt [7] named Hormodendrum pedrosoi when he studied the first known South American cases. The latter fungus has been the etiologic agent in most of the studied cases from other parts of the world (including those from Puerto Rico [8]); the relationship between the two pathogens will be discussed in a later paragraph.

Read before the Section on Dermatology and Syphilology at the Ninety-First Annual Session of the American Medical Association, New York, June 14, 1940.

1. Medlar, E. M.: A Cutaneous Infection Caused by a New Fungus, Phialophora Verrucosa, with a Study of the Fungus, J. M. Research **33**: 507-521, 1915; A New Fungus, Phialophora Verrucosa, Pathogenic for Man, Mycologia **7**: 200-203, 1915.

2. Lane, C. G.: A Cutaneous Disease Caused by a New Fungus (Phialophora Verrucosa), J. Cutan. Dis. **33**: 840-846, 1915.

3. Wilson, S. J.; Hulsey, Sim, and Weidman, F. D.: Chromoblastomycosis in Texas, Arch. Dermat. & Syph. **37**: 107-122 (Jan.) 1933.

4. Moore, Morris, and Mapother, Paul: Chromomycosis of the Face: Report of a Case and a Study of the Causative Organism, Phialophora Verrucosa, Arch. Dermat. & Syph. **41**: 42-54 (Jan.) 1940.

5. Martin, D. S.; Baker, R. D., and Conant, N. F.: A Case of Verrucous Dermatitis Caused by Hormodendrum Pedrosoi (Chromoblastomycosis) in North Carolina, Am. J. Trop. Med. **16**: 593-619 (Sept.) 1936.

6. Weidman, F. D., and Rosenthal, L. H., to be published.

7. Brumpt, Emile: Précis de parasitologie, ed. 3, Paris, Masson & Cie, 1922, p. 1105.

8. Carrión, A. L.: Chromoblastomycosis in Puerto Rico, Puerto Rico J. Pub. Health & Trop. Med. **14**: 37-55 (Sept.) 1938. Carrión.[10]

Another case, one in Miami, is also known,[9] but a report of this case has not yet been published. The paucity of reported cases may be an indication of an actual rarity of the disease. Probably, however, many unrecognized and unreported cases occur in the United States.

The scattered distribution of the disease, as shown on the accompanying map (fig. 1), the lack of familial spread and other epidemiologic evidence indicate that the disease, while geographically widespread, is not at all contagious. In many cases there has been a history of injury by wood or vegetation preceding the development of the lesion.

Classic chromoblastomycosis is a chronic and slowly progressing disease characterized clinically by the presence, usually on the leg or foot, of lesions which may be pink or violaceous and verrucous or papillomatous and may become elevated as much as 10 mm. above the surface of the skin. In some of the lesions proliferation of the infected tissue produces pedunculated cauliflower-like excrescences, the uneven surface of which readily ulcerates. A moderate degree of elephantiasis often develops. Typical lesions of this type usually develop only after many years' duration. Four of the five cases previously reported from continental United States differed widely from this type. Weidman and Rosenthal [6] have recently analyzed the cases of chromoblastomycosis which are unusual as to clinical type or anatomic location. The character of the lesions on the foot may be modified by factors such as the pressure of a shoe.

Our case, while not unique, adds another to the list of cases which differ from the classic type. Its unusual clinical features are probably a reflection of the early stage at which the diagnosis was made and therapy begun. We are reporting this case because of the atypical appearance and location of the lesion, the good response to therapy (perhaps also dependent on the short duration of the infection), the apparent rarity of the disease and the stimulation it may give to a search for additional cases in the United States.

REPORT OF CASE

A white man aged 68, a farmer, came to the Atlanta Cancer Clinic thinking that he had a cancer. The lesion (fig. 2), which was of three months' duration, was on the dorsum of the left wrist. It was 4 cm. in diameter, elevated, a bluish red (livid), boggy to the touch, with multiple points of discharge. The clinical appearance suggested blastomycosis, and that diagnosis was at first made. Cultures were made from the pus. A dark colored fungus which was typical of Hormodendrum pedrosoi grew in the cultures, and the diagnosis was accordingly changed to chromoblastomycosis. No biopsy specimen was taken. The clinical features differed so widely from those of a typical chronic case of chromoblastomycosis that the diagnosis was possible only by laboratory methods.

The patient received 150 roentgens on the day he was first seen and 75 roentgens two weeks later. Saturated solution of potassium iodide was administered, beginning with 30 drops after each meal, the patient receiving a total of 90 drops on the first day. Each dose was increased by 1 drop on the following day and on each succeeding day until 50 drops was being taken after each meal (total daily dosage 150 drops) on the twentieth day of treatment. The patient was then instructed to reduce the daily dosage by similar steps until the dosage was back at 30 drops three times a day, at which dosage it was continued. After three months the patient was clinically well and remained so to the time of his accidental death a few

9. Personal communication from Drs. Wiley Sams and Fred D. Weidman.

months later. The period during which the patient remained under observation after his apparent cure was short for a guaranty of cure in this disease, but the lesion appeared to be completely healed.

The fungus isolated from this patient (fig. 3) is entirely typical of Hormodendrum pedrosoi. It has the gross and morphologic features of other strains of this fungus isolated in other parts of the world. On an acid dextrose agar medium after four weeks' growth at room temperature the fungus colony is about 4.5 cm. in diameter, with the shape of a low cone about 7 or 8 mm. high. It is a dark olivaceous, but some degree of zonation is apparent, the colors varying from gray-green or blue-green in a narrow zone at the periphery to olive at the center. The surface is covered with short, delicate, ascending aerial hyphae which appear grayish and through which the darker colors of the mycelial mat and substrate hyphae can be seen.

In well developed spore heads there is an arborescent development (figs. 4 *A* and *B*) resembling that seen in saprophytic species of Hormodendrum (Cladosporium). Because the branching chains of dark colored spores break apart so readily, this feature is difficult to demonstrate unless slide cultures are very carefully prepared and studied or unless a plate culture is viewed from

Fig. 1.—Geographic distribution in continental United States of reported cases of chromoblastomycosis. Circles, Phialophora verrucosa; triangles, Hormodendrum pedrosoi.

above with the low powers of the microscope. In a preparation mounted for microscopic study, by teasing out material in a mounting fluid, most of the spores seen will be broken loose from the conidiophores (fig. 4 *C*). In most of the conidiophores no elaborate system of branching spore chains is formed. A more depauperate type of sporulation is substituted in which the spores are borne acropleurogenously—that is, at the tip and along the sides of the conidiophore (fig. 4 *D*). This is the type of sporulation referred to in studies of this fungus as the Acrotheca type of sporulation. Various combinations of the two methods of development can be found (figs. 5 *A* and *B*). An even more reduced type of sporulation is shown in figure 5 *C*. Here clusters of spores are borne on very short lateral conidiophores, or they may even be sessile on the vegetative hyphae. Finally, a few spores are borne (fig. 5 *D*) in the same manner as those of Phialophora verrucosa, the other common etiologic agent of chromoblastomycosis. This type of sporulation, only recently demonstrated in Hormodendrum pedrosoi,[10] indicates the existence of a close relationship between the two etiologic agents of the disease.

The appearance of colonies and the microscopic morphology vary to some extent between different strains of this fungus. These variations are described in detail elsewhere and need not be reviewed here.

Hormodendrum pedrosoi is similar to related species of molds which are commonly present on dead grass

Fig. 2.—Lesion of chromoblastomycosis on wrist.

and other vegetation. These molds are classified as species of Hormodendrum in many mycology laboratories. In this paper we are using the name which was originally given to this pathogenic species by Brumpt,[7] namely, Hormodendrum pedrosoi. Thom[11] has recently pointed out that this generic name is a synonym of the older name, Cladosporium. We recognize the claim to priority of the generic name Cladosporium but are not now prepared to recommend a change in name. There have been numerous other proposed revisions in nomenclature[12] but they will not be reviewed at this time. Any change which could be made at the present time would, we feel, be a temporary one, probably requiring another change in the near future. Hormodendrum pedrosoi is obviously related to saprophytic species common on vegetation, but we do not yet know how close this relationship is or whether Hormodendrum pedrosoi is a depauperate species of the genus growing normally in this environment or whether it is a mutant arising under the influence of association with animal tissue. There is, moreover, a relationship with the other common etiologic agent of the disease, Phialophora verrucosa, which is not yet fully understood.

Fig. 3.—Strain of Hormodendrum pedrosoi isolated from the subject of the present report. On cornmeal agar after two weeks' incubation at 30 C.

Phialophora verrucosa sporulates by budding out small hyaline or slightly pigmented spores in the base of a cuplike structure terminating the conidiophore. Carrión and Emmons,[10] after careful study of slide cultures of Hormodendrum pedrosoi, demonstrated that in all their strains of this fungus the Phialophora type of sporulation occurs, although very rarely in most strains. This report was

10. Emmons, C. W., and Carrión, A. L.: The Phialophora Type of Sporulation in Hormodendrum Pedrosoi and Hormodendrum Compactum, Puerto Rico J. Pub. Health & Trop. Med. **11**: 703-710 (June) 1936. Carrión, A. L., and Emmons, C. W.: A Spore Form Common to Three Etiologic Agents of Chromoblastomycosis, ibid. **11**: 114-115 (March) 1935.

11. Thom, Charles: Naming Molds, J. Washington Acad. Sc. **30**: 49-64, 1940.

12. Moore, Morris, and deAlmeida, Floriano Paulo: New Organisms of Chromomycosis, Ann. Missouri Botan. Garden **28**: 543-552, 1936. Negroni, Pablo: Estudio micológico del primer caso argentino de cromomicosis Fonsecaea (n. g.) pedrosoi (Brumpt, 1921), Rev. d. Inst. bact. **7**: 419-426 (March) 1936. Carrión, A. L.: Puerto Rico J. Pub. Health & Trop. Med., to be published.

confirmed by Conant [5] and by Moore.[12] Conant [13] made the further important observation that one of the species of Cadophora, C. americana, is identical with Phialophora verrucosa. The species of Cadophora are commercially important because they cause an undesirable staining and decay of wood pulp. There is therefore a relationship, as yet imperfectly understood, between the common saprophytic species of Hormodendrum or Cladosporium found on dead brown grass, some of the fungi causing "blueing" of wood pulp, and the two dissimilar but apparently related fungi which cause the majority of cases of chromoblastomycosis. If and when this relationship is more fully known it may be found necessary to make some revision in the nomenclature of the etiologic agents of chromoblastomycosis. Until further studies have been made in an effort to elucidate this problem, we do not see any advantage to be gained by a temporary revision.

Fig. 4.—*A* and *B*, dendroid spore heads from cornmeal agar slide culture; *C*, spores dissociated from the conidiophore; *D*, the "Acrotheca type" of sporulation in Hormodendrum pedrosoi.

APPLICABILITY OF THE NAME "CHROMOBLASTOMYCOSIS" TO THE DISEASE

Some discussion of the nomenclature of the disease is also necessary. Moore has proposed to change the name of the disease to "chromomycosis," because, as has been pointed out by many investigators, the fungus does not grow in the tissues by budding. The criticism is valid but the importance one attaches to it depends on how strictly the prefix "blasto" is defined. This prefix connotes a budding type of growth but in practice has been used loosely. In chromoblastomycosis the divergence from a yeastlike development is great. Septation of spherical or egg-shaped cells is frequent, and well developed hyphae may appear in the superficial crusts. True budding does not occur. In American blastomycosis the resemblance to yeasts is greater, but here too differences are apparent. Blastomyces dermatitidis, the etiologic agent, is in culture a Hyphomycete with no resemblance to the yeasts. The parasitic phase in tissues presents the aspect of budding, but even here it does not look like a true yeast. Furthermore, one can find many cells which clearly represent abortive attempts to form hyphae. This characteristic is more easily interpreted when one studies the growth of this fungus on blood agar, on which it shows characteristics of both budding and hyphal growth. In short, both blastomycosis and chromoblastomycosis can be criticized as inappropriate names, since neither is caused by a true budding or yeastlike fungus. There seems to be little more reason for rejecting one than the other.

The disease was named chromoblastomycosis because of its resemblance to American blastomycosis, the prefix indicating that the etiologic agent was pigmented. There are further newly emphasized reasons for retaining the old name which expresses this relationship. It has been recently pointed out,[4] and it is again illustrated by the case we are reporting, that many cases of chromoblastomycosis, particularly those in temperate climates, bear a close clinical resemblance to blastomycosis. There is therefore, perhaps, more justification on these grounds for the name now than when it was first used. The criticisms listed here do not appear to us to be sufficient reason for changing the name, especially since it has not been a source of confusion.

OBJECTIONS TO THE NAME "CHROMOMYCOSIS"

There are definite objections to the name "chromomycosis." It focuses attention more sharply on the prefix and would indicate that the disease is one which is characterized primarily by pigment changes in the infected tissues. Finally, the name is too nearly like the name chromophytosis (tinea versicolor), which is a fungous disease or group of related diseases characterized by just such pigment changes in the skin and is wholly unlike blastomycosis or chromoblastomycosis.

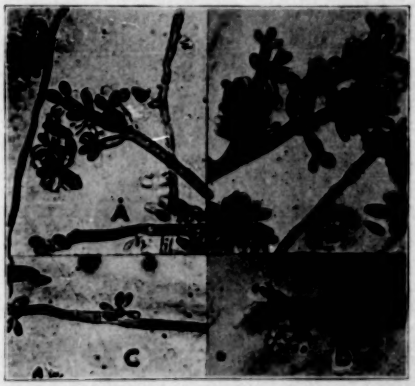

Fig. 5.—*A* and *B*, complex conidiophores combining different types of sporulation; *C*, knoblike conidiophores; *D*, phialophora type of sporulation in Hormodendrum pedrosoi.

SUMMARY

In a case of chromoblastomycosis, the sixth reported from continental United States, the etiologic agent

13. Conant, N. F.: The Occurrence of a Human Pathogenic Fungus as a Saprophyte in Nature, Mycologia **29**: 597-598, 1937.

was Hormodendrum pedrosoi. The case is interesting because of the early diagnosis (the case was of three months' duration), the unusual location of the lesion (wrist) and the apparently good response to potassium iodide therapy.

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ABSTRACT OF DISCUSSION

Dr. Joseph Gardner Hopkins, New York: This seems more significant than the mere report of one conditional case of a rare disease, because cases of this disease, which Lane first described, have been cropping up more and more frequently of late. One suspects that it is probably more common than is realized. It is easy to see from the photograph which was presented that we may be missing cases which do not show the enormous warty growths that dermatologists are accustomed to think of as characteristic of the disease. This should stimulate us to be on the outlook for this condition in all our clinics. A second point of interest is the authors' treatment. The prognosis in chronic cases has seemed so bad that it does somewhat change our ideas to find a case that responded rather rapidly and apparently satisfactorily to therapy, although we do not know the later outcome. A third point that appealed to me in the report was the resistance of the authors to the temptation to change names. The thing that has done more to make mycology difficult and thereby has retarded its development has been the tendency to take well known fungi and fungous diseases and give them new names. It is that pernicious tendency which makes the literature of mycotic infections so extremely difficult to read intelligently and to evaluate at all.

Dr. W. M. Sams, Miami, Fla.: I had the opportunity of observing a case in Miami, as yet unreported. The lesion was on the left hand, was somewhat more verrucous than the photographs would indicate in the case reported by the authors. It was about the same size and was of more than twenty years' duration and yet had caused little or no difficulty. It responded to roentgen therapy and iodides with the greatest of ease. I saw the patient over a year ago but have not yet been able to find him again. This case did not originate in continental United States strictly speaking but occurred in a Nassau Negro, born in the Bahama Islands. He dates the onset of his trouble to an injury received when he struck his hand on a piece of wood or the gunwale of a boat about twenty years prior to the time at which I saw him.

Dr. Fred D. Weidman, Philadelphia: Our knowledge of this disease is rapidly increasing. Counting Dr. Sams's unreported case, it totals 7 for the United States; if we add Puerto Rico, the number is more than doubled. Practically all of this has occurred in the short space of seven years. In other words, it is the old story in medicine: namely, once we become aware of the possibilities of the presence of a condition and begin to look for it, we begin to find it. Dr. Pardo Castello recently sent me a list of 20 histologically proved cases that he had found in Havana in the last two years and a half! In short, there is a second hotbed of chromoblastomycosis in the world. The original and probably still the hottest one is in Brazil. There is thus a focus close to continental United States, namely, Cuba and Puerto Rico, which is significant in relation to Dr. Sams's case in Miami, and the authors' case from Atlanta. The original and supposedly typical clinical expression of the disease, namely those gigantic excrescences such as were seen on the screen on the leg of a patient, is not the type that is usually encountered in the United States. Perhaps we shall eventually be able to generalize to the effect that these lush examples of chromoblastomycosis are the kinds that are to be met in the tropics. In the United States only one of the 7 cases thus far reported has been of that type, namely the case of Wilson et al. in Fort Worth. All the others have been the simple types, but being simple they approach more closely the clinical picture of syphilis, tuberculosis verrucosa cutis, blastomycosis, frambesia, sometimes leprosy, dermatitis vegetans and a number of that sort. The diagnosis may be made easily. Scrapings and pus frequently give immediate microscopic diagnosis by the potassium hydroxide technic, and the appearance of histologic sections is diagnostic even under the low power of the microscope. It is safe to predict that we are going to encounter increasing numbers of cases of chromoblastomycosis.

Morris Moore, Ph.D., St. Louis: Chromomycosis, as I prefer to call it, is so named because I find that the budding which is typical of blastomycosis is not found in this disease; instead one sees a "breaking off" of cells to form mulberry-like clusters, which is entirely different from the original conception of blastomycete formation. Chromomycosis was described for the first time in São Paulo, Brazil, by Pedroso, who called it a "black blastomycosis." In 1920, with Gomez, he published a series of 4 cases from Brazil, illustrating a number of clinical types involving the hands, feet and I believe one occurring on the neck. Recently a lesion of the face was described in a case from St. Louis. This lesion also was unusual in the sense that it seems to bring out the idea set forth by Dr. Conant that the organism is found in nature as a saprophyte on plants and wood. The patient had been a log handler for years. Ten years previously to his entry into our clinic he had burned his face with a match and perhaps the handling of logs brought out his infection in due course of time. I believe our patient has been fairly well cleared up, although he had some cerebrospinal symptoms which perhaps were not associated with his chromomycosis. We have not been able to contact him again. There are a number of organisms which may produce this disease. I have found all the fungous characteristics; that is, branching and the kind of cell formation typical of the Hormodendrums, the cup formation of Phialophora and the Acrotheca type of "knotty stick" all in one genus. There are more than just Hormodendrum pedrosoi and Phialophora verrucosa as causative organisms in chromomycosis. In 1935 I published a paper in Argentina discussing the relationship and derivation of the various genera. On my return I received a reprint from Dr. Negroni of Buenos Aires with the inscription that because one of the genera failed to have a Latin description he had to describe a new genus. Consequently it may be concluded that, even though some writers may not be in accordance with me completely, the idea is prevalent that there are several different organisms. I still think, as all others have thought, that in due course of time we shall have a large number of cases really to explain this serious disease, because at times it is extremely serious with surgery the only course of treatment.

Dr. Hugh Hailey, Atlanta, Ga.: We are indebted to Dr. Emmons for his interest and his laboratory observations of this rare mycotic infection. From the clinical point of view, the lesion of this patient could not be differentiated from that of blastomycosis. The history of trauma three months prior to our inspection, the clinical appearance and the typical response to iodide therapy are observations which correspond with blastomycosis. It was only by means of laboratory studies that the correct diagnosis could be determined. On March 11, 1939, when I first saw the patient, the lesion was 4 cm. in diameter and had a definite verrucous and honeycombed margin from which purulent material could be expressed by gentle pressure. The proximal half of the margin was more elevated and more active than the distal half. The central depressed area was composed of smooth, reddened scar tissue. On March 25 the margin was smoother, less reddened and somewhat flattened. I saw the patient again on April 8, when it was noted that improvement continued. On April 28, inflammation had subsided markedly and the verrucous border had disappeared. His final visit was May 26, at which time the note was recorded that slight redness remained and that the margin was flattened and practically level with the surrounding normal skin. Post-inflammatory pigmentation was present. Our final report came from his daughter, relating his accidental death on July 4, also stating that the lesion was entirely healed. In our opinion the clinical cure was attained by iodides; roentgen rays were not an important adjunct to the treatment. We hope that this presentation will create more interest among fellow physicians in mycotic infections with the purpose of isolating more cases of this uncommon disease, for we feel that it is not so rare as the literature now reveals.

RADIATION IN THE TREATMENT OF CARCINOMA OF THE BODY OF THE UTERUS

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AND
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ST. LOUIS

Analysis of clinical results obtained in carcinoma of the body of the uterus has revealed two factors of fundamental importance in the treatment of operable cases. The first is that hysterectomy alone is inadequate treatment for certain types of clinically operable patients. The second point is that average results can be improved by combining radiation with surgery. Several authors have demonstrated a close relationship between microscopic appearance of tumor and end results. Collected statistics for hysterectomy alone given in an earlier publication show a greater percentage of five year cures among the well differentiated lesions than in the more anaplastic varieties.[1] More recent data presented by Scheffey and Thudium,[2] Ward and Sackett,[3] Healy and Brown [4] and others illustrate the importance of combining radiation with surgery in the attempt to improve clinical results, particularly among lesions of histologic types known to have a less favorable prognosis. For reasons not yet fully understood, preoperative irradiation is more effective than treatment administered after hysterectomy. One factor is the greater total dose that can be given by means of intra-uterine radium applied before removal of the uterus.

Fig. 1.—Uterus that received 4,000 mg. hours of radiation by an intra-uterine tandem applied one month before hysterectomy. Specimen from the museum of the Department of Gynecology, Washington University. Courtesy of Dr. W. C. Scrivner.

Owing to the excellent results obtained in the adult types of corpus cancer by surgery alone, there is a temptation to restrict the use of preoperative irradiation to the more undifferentiated lesions. A plan of that sort is founded on the belief that there are several different varieties of endometrial cancer. That such a variation exists clinically seems to be an established fact. There are, however, other factors that affect prognosis, such as the size of the uterus, the presence of infection and downward extension of the tumor into the cervix. An attempt to rely entirely on histologic features for individualization of treatment may entail an untoward risk for the patient. It is well known that some tumors may develop changes toward anaplasia and that others during treatment may undergo maturation toward a more adult type.[5] The possibility cannot be excluded that various histologic types merely represent different stages through which an individual lesion may pass.[6] A low grade tumor showing tendencies toward undifferentiation would certainly be expected to have clinical properties resembling lesions of a higher type. The question then arises as to whether undifferentiation is more apt to be the result of tumor age or the individual biologic properties of a given lesion. If anaplasia is more closely associated with the age of the tumor, a greater percentage of bulky and advanced lesions is to be expected among those types. Evidence that they tend to be more advanced is shown by the high incidence of recurrence following hysterectomy alone. It cannot be stated, however, whether the tendency to involve regions outside the volume of tissue removed at operation is the result of slow invasion of an old tumor or more rapid infiltration by a young lesion. Those questions may be of only academic interest but they raise an interesting problem for investigation. An attempt should be made to correlate gross appearance with microscopic features. Wide variations are to be expected, but undoubtedly there are small local lesions of the undifferentiated type. As far as clinical practice is concerned, however, it seems best to employ pre-

Fig. 2.—Intra-uterine tandem used in conjunction with multiple capsules of radium.

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From the Barnard Free Skin and Cancer Hospital and the Edward Mallinckrodt Institute of Radiology and Department of Obstetrics and Gynecology, Washington University School of Medicine.

1. Arneson, A. N.: Clinical Results and Histologic Changes Following the Radiation Treatment of Cancer of the Corpus Uteri, Am. J. Roentgenol. **36**: 461-476 (Oct.) 1936.

2. Scheffey, L. C., and Thudium, W. J.: Experience in Treatment of Carcinoma of Fundus Uteri with Five Year End Results in Forty-Seven Patients, Am. J. Obst. & Gynec. **38**: 1006-1019 (Dec.) 1937.

3. Ward, G. G., and Sackett, N. B.: Results of Radiation Therapy for Carcinoma of the Uterus at Woman's Hospital, New York, 1919-1932, J. A. M. A. **110**: 323-327 (Jan. 29) 1938.

4. Healy, W. P., and Brown, R. L.: Experience with Surgical and Radiation Therapy in Carcinoma of the Corpus Uteri, Am. J. Obst. & Gynec. **38**: 1-13 (July) 1939.

5. Arneson, A. N., and Stewart, F. W.: Clinical and Histologic Changes Produced in Carcinoma of the Cervix by Different Amounts of Roentgen Radiation, Arch. Surg. **21**: 542-567 (Oct.) 1935.

6. Teacher, J. H.: A Manual of Obstetrical and Gynaecological Pathology, edited by Alice J. Marshall, New York, Oxford University Press, 1935, p. 285.

operative irradiation in all operable cases rather than attempt to individualize the treatment on the basis of the biopsy specimen. It should be noted also that, in spite of variations in response to radiation shown by different types of corpus cancer, there seems to be no great justification at the present time for veering from the generally accepted belief that hysterectomy, whenever practical, remains the fundamental procedure.

Because of the relatively inaccessible location of the lesion, the radiation treatment of corpus cancer presents technical problems more difficult than those found in the cervix. The fundamental principles of irradiation, however, are exactly the same. In every instance the attempt must be made to deliver throughout the tumor-bearing region a dose believed to be adequate for control of the lesion in question. It is obvious that outlying tumor cells will receive lesser amounts than cells located nearer the irradiating sources. In the attempt to increase the dose reaching distant regions

Fig. 3.—Uterus removed eight weeks after radium treatment shown roentgenographically in figure 2.

some of the more proximal points may be overtreated. This entails risk of both permanent damage to normal structures and extensive necrosis of tumor. Marked destruction of tissue by radiation with loss of integrity of the tumor bed not only results in complicating infection but also in interference with the orderly processes of regression. Such a breakdown in tissue may be followed by unrestrained growth of tumor.[7] It is essential that every effort be made to decrease the discrepancy between the minimum dose delivered to some regions and the maximum amount falling on other points. It is only by improvement in the distribution of radiation that the possibility for delivering an adequate dose throughout the tumor-bearing region can be increased with a minimum risk of radiation sequelae.

Variations in the distribution of radiation are more marked for radium than for x-rays. Surrounding every radium source buried in tissue or in a body cavity there is an inner zone within which necrosis may occur and an outer zone receiving a dose adequate for the control of cancer. The respective volumes of tissue representing those zones varies with the dose employed as well as all other physical factors of the treatment. For a specified dose, differences in the two volumes might

Fig. 4.—Distribution of radium obtained in a patient not treated with a tandem owing to absence of involvement of the cervical canal and the short length of the uterine cavity. Distortion of the uterus is due to excessive packing of the vagina.

be very slight in extremely radioresistant lesions with a low threshold for necrosis. Infection is one of the important factors believed to contribute to greater radioresistance of tumor cells and increased susceptibility of the tumor bed to necrosis.[8] In the treatment of cervix cancer the use of preliminary x-rays has proved of great value in the attempt to decrease preexisting infection before the application of radium.[9]

Fig. 5.—Uterus removed six weeks after radium treatment shown roentgenographically in figure 4.

The same procedure is equally effective in the treatment of corpus cancer. The decrease in infection obtained by a course of roentgen radiation lessens the

7. Stewart, F. W.: Radiosensitivity of Tumors, Arch. Surg. 27: 979-1064 (Dec.) 1933.

8. Arneson, A. N., and Hauptman, Harry: Radium Needles in the Treatment of Carcinoma of the Cervix and Vagina, South. M. J. 33: 286-293 (March) 1940.

9. Arneson, A. N.: Irradiation of Malignant Diseases of the Female Genitals, Am. J. Obst. & Gynec. 33: 893-901 (May) 1937.

risk of marked destruction of the tumor bed by intra-uterine radium. Furthermore, regression in the size of the lesion may facilitate the intra-uterine treatment of bulky tumors presenting technical difficulties interfering with a suitable application of radium. Finally, the dose contributed by x-rays, combined with that obtained from radium, increases the total volume of tissue receiving an adequate amount of radiation.

The intra-uterine applicator most frequently used in radium treatment of corpus cancer is a tandem of two or more capsules. In most instances the active length of the applicator extends from the level of the external os to the top of the fundus, with the sources in the uterine cavity containing greater amounts of radium than those in the cervical canal. There are two important objections to this method of treatment. In the first place radium applied by tandem may be located at distances from tumor that are enormous in relation to the rapid decrease in intensity occurring within a few millimeters of a given source. If the cavity is distorted by a bulky lesion or by a submucous myoma the tandem must be pushed to one side, so that considerable tissue may intervene between radium sources and some tumor cells. In cavities that are not distorted the radium may also fail to come in close contact with tumor in patients presenting small lesions located in one horn of the uterus. The second objection to a tandem is made on the basis of the distribution of radiation obtained from such a method of application. In the attempt to deliver an adequate dose to the entire uterus it is obvious that, as a result of the small number of sources employed, each single tube must contribute a relatively large amount of radiation. It is impossible, therefore, to prevent necrosis in tissues immediately adjacent to the tandem. Inadequacies of this method of treatment are shown in the photograph of the gross specimen given in figure 1. This patient, treated a few years ago, had a uterus slightly larger than normal with a bulky tumor in the fundus. Without preliminary x-rays, and one month before hysterectomy, she was given 4,000 mg. hours radiation by an intra-uterine tandem containing 100 mg. of radium. The upper portion held 75 mg., and 25 mg. was in the cervical end. The treatment not only failed to control the lesion but also resulted in considerable necrosis of tissue near the stronger part of the applicator.

One of the most practical methods for improving the distribution of radiation is the use of a greater number of irradiating sources.[10] By means of the contribution from each of the different tubes, the minimum tumor dose can be increased without employing any single source for an amount apt to result in extensive necrosis of adjacent tissue. The placing of multiple capsules inside the uterine cavity will also decrease the risk, noted for the tandem, of radium being too distant from all or portions of a corpus lesion. In the attempt to improve intra-uterine treatment several authors have devised special applicators. Some of those are described elsewhere,[1] and more recently Martin[11] has reported the use of small capsules of relatively low radium content attached by hinges to long wires so that they can be applied directly to the affected portion of the uterine cavity. Crossen[12] places one or more small capsules inside a rubber tube supported by a wire which can be sutured to hold the distributors at a given depth and in a position preventing movement of sources in each lateral horn alongside an intra-uterine tandem. One of the most effective methods appears to be that devised by Heyman.[13] Capsules of a standard size containing small amounts of radium are introduced singly into the uterus until the cavity is completely filled.

A few years ago we began the use of a technic requiring a minimum of special apparatus in the attempt to devise a method not too elaborate to be found practical in most clinics. A method of that order must be one easily applied to a variety of lesions, including those presenting different degrees of distortion of the uterine cavity. The most logical procedure is the use of multiple capsules introduced singly into all available space in the attempt to obtain a satisfactory arrangement of radium that will correct the objections already made for a tandem. The various sources should be of a fairly uniform size and strength, each containing a small amount of radium. In many institutions, however, the number of relatively weak sources may be inadequate for all patients. Tubes containing greater amounts can be used if held inside an applicator or within a medium increasing the distance between radioactive material and the surface to which it is applied. By that means the intensity of radiation falling on the nearest tissue may be reduced to a rate approaching that obtained from weaker sources. The majority of clinics have a few tubes containing 25 mg. of radium or less, and lightly filtered needles of about 10 mg. strength are in fairly common use. It is a relatively simple matter to obtain capsules for holding those sources individually that will not only increase distance but also supply adequate filtration. If the uterus is not completely filled, however, and the application is checked by means of a roentgenogram taken while the radium is in place, it will be found that most of the sources invariably form an impaction in the lower uterine segment. This can be prevented if, during the insertion of radium, strips of narrow gauze are introduced to hold the tubes in place. Gauze employed in that manner also serves as a medium for increasing distances around capsules containing greater amounts of radium.

In applying radium to a given patient, the various capsules selected for treatment are first attached to a long and durable ligature. A single or double thickness of quarter inch gauze packing is folded over one of the stronger sources and introduced into the right or left cornu by means of uterine dressing forceps. The same procedure is carried out in the opposite horn, but the first gauze strip and ligature must be held firmly to prevent them from being pushed into the cavity. Weaker sources are reserved for central insertion in the attempt to deliver a more uniform distribution of radiation throughout the uterus. With the introduction of each additional radium capsule a small amount of gauze is pushed into the cavity from one of the two strips hanging from the external os. The cervical canal must be kept well dilated to insure safe and easy removal of all the sources. This can be done with packing or by placing the tube of greatest diameter at that point.

In the cervical canal and lowest portion of the uterine cavity it is usually unpractical as well as unnecessary to place two or more capsules in parallel. A short tandem is well suited to the treatment of that region.

10. Arneson, A. N.: The Distribution of Radiation Within the Average Female Pelvis for Different Methods of Applying Radium to the Cervix, Radiology 29:1-20 (July) 1938.
11. Martin, C. L.: Radiation Therapy in Carcinoma of the Fundus of the Uterus, South. M. J. 33:135-143 (Feb.) 1940.
12. Crossen, H. S.: Personal communication to the authors.
13. Heyman, J.: Radiumhemmet Method of Treatment and Results in Cancer of the Corpus of the Uterus, J. Obst. & Gynaec. Brit. Emp. 43: 655-666 (Aug.) 1936.

It should be noted, however, that among patients with deep cavities, or in those with downward extension of the lesion into the cervix, the dose per centimeter tandem length must in most instances be greater than that which would be obtained from a tandem composed of capsules of the same strength as those used higher up in the uterus. As an example of such an instance may be cited a patient presenting a cavity more than 4 inches deep with evidence at curettement of involvement extending into the cervical canal. Following a preliminary course of x-rays, seven capsules of 10 mg. each (two were of smaller size than the others) were packed into the upper uterus. A tandem about 5 cm. long containing two tubes of 25 mg. each was inserted into the cervical canal. A roentgenogram made during treatment is shown in figure 2. It can be seen that the various sources are fairly well separated by gauze and extend out into each horn, but at the middle of the uterus there may be an unnecessary congestion of radium. The patient received approximately 5,800 mg. hours of radiation. Each of the separate capsules had an active length of about 2 cm. and delivered 480 mg. hours. The dose from the tandem was about 480 mg. hours per centimeter of length.

Eight weeks after radium treatment the uterus was removed. A photograph of the gross specimen opened along the right lateral border and across the top of the fundus is shown in figure 3. There was considerable

Average Number of Capsules and Total Doses of Radiation Employed in Uterine Cavities of Different Lengths

Total Number of Patients	Average Depth Cavity, Inches	Average Number of Sources	Average Total Dose, Mg. Hrs.	Average Dose per Source, Mg. Hrs.
8	3 to 4	6	4,800	800
7	4 to 5	8	5,600	700
3	5 to 6	9	6,100	675

necrosis and ulceration involving the cervical canal and lower portion of the uterine cavity. The distribution of this reaction seemed to correspond roughly to the location of the tumor. There was less destruction of tissue in the fundus, but all of the endometrium in that region showed marked evidence of radiation effect with an accompanying inflammatory exudate. Microscopic study of sections cut from various regions of the uterus showed persistent but markedly degenerated tumor in some areas. It is impossible to state whether cells showing such marked degeneration eight weeks after radium treatment might recuperate to form actively growing and fully viable cancer. At the same time the persistence of recognizable tumor illustrates the importance of following irradiation with hysterectomy.

In this case it is difficult to explain either the gross variations in tissue damage or the survival of cancer in areas showing the greatest destruction. It is true that both of those phenomena were noted chiefly in a region believed to correspond to the location of the primary lesion. As far as injury to tissues is concerned, one might expect radiation to produce a greater effect in the tumor area than in the fundus which was relatively free from involvement. At the same time the difference in degree of damage occurring in the two poles of the uterus is greater than that which would be expected for a reasonably uniform distribution of radiation. It cannot be explained on the basis of overtreatment of the lower region, however, because necrosis extended over an area greater than the length of the tandem. Careful examination of the roentgenogram and all physical factors of the treatment indicates that only in the region about the upper end of the tandem was there risk of delivering an excessive dose. Furthermore, the marked evidence of effect of radiation in uninvolved endometrium lining the fundus indicates that the upper part of the uterus received a large dose despite the absence of necrosis. It would appear that in this tumor factors were present which tended to increase the radioresistance of cancer cells and lower the threshold for necrosis. Before treatment there was clinical and histologic evidence that the lesion was badly infected and ulcerated.

Preoperative irradiation may result in complete disappearance of tumor without necrosis. In such instances, however, the lesions tend to be smaller with less evidence of infection and ulceration. In figure 4 is shown the distribution of radium obtained in a case in which there was a cavity 3 inches deep. The use of a tandem was not deemed essential, owing to the lesser depth of the cavity and the absence of involvement of the cervical canal. Seven tubes containing 10 mg. of radium each were packed into the uterus with one of the capsules resting in the cervical canal.[14] The total dose was 3,500 mg. hours of radiation. Treatment was given with the same sources used in the first case. Each capsule had an active length of about 2 cm., and the dose per radium tube was essentially the same in the two instances. In the first case it was 480 mg. hours per source and in the second it was 500 mg. hours of radiation. Hysterectomy was performed six weeks after radium treatment in the last case. The reproduction of a photograph of the gross specimen is shown in figure 5. There was no deep necrosis of tissue, but all of the endometrium showed marked evidence of radiation effect including the usual inflammatory exudate. Within the cervical canal, however, the reaction was of a lesser degree. No residual tumor was found in the examination of sections removed from various parts of the uterus.

Explanation of the difference in response to irradiation shown in the cases discussed would seem to be found in the biologic properties of the two lesions rather than in the physical factors of treatment. It has already been pointed out that the dose delivered by each radium source was essentially the same in the two instances. The two uteri also received about the same tumor dose despite the fact that the total number of milligram hours of radiation in one was considerably greater than in the other. In the attempt to deliver a comparable tumor dose to all patients, it is obvious that the total amount of radiation and the number of sources used in treatment must vary with the size of the cavity and the tumor-bearing region. In the table are given averages for the number of capsules and total doses used in cases presenting cavities of different depths treated prior to 1940. It can be seen that the values given for the average dose per radium source are high in comparison with those used in the two cases described. Values for the number of capsules employed in treatment appear to be low. Those differences are due to the more frequent use of a smaller number of stronger sources among the first patients treated with multiple capsules. It should be noted, however, that the average dose per source decreases

14. In the roentgenogram one source of radium cannot be visualized. Angulation in the shape of the uterus is due to excessive packing of the vagina. In this case the cervical canal was kept well dilated with gauze. A better procedure would have been the use of a capsule of greater diameter in that region.

with the use of a greater number of tubes in the larger uteri receiving greater total amounts of radiation. That factor is of considerable importance and must be taken into account in planning the treatment of each patient.

The physical factors of radium treatment are very complex, and it must be admitted that sources of various size and strength have been used at different and sometimes unknown distances without any attempt being made to calculate tissue doses. It is obvious, therefore, that no high degree of accuracy has been attained in the attempt to deliver comparable amounts to all patients. Neither can it be said that the distribution of radiation has been satisfactory in every instance. Complete filling of the uterine cavity with capsules of the same length, diameter, filter and strength would standardize many of the physical factors of treatment. Even by that means, however, there would be variations in the dose delivered throughout the tumor-bearing region as the result of irregularities in the arrangement of radium with variations in the shape of the cavity in different cases. The fact remains, nevertheless, that any attempt to increase the number of sources used in treatment will improve the distribution of radiation. Among the eighteen patients in our series there was less variation in the minimum tumor dose each received than in the maximum amounts arriving at points nearer the irradiating sources. In every instance the minimum tumor dose was greater than that which could have been obtained from a tandem alone. It is also reasonable to believe that, for the control of tumor within a given volume of tissue, there was a lesser amount of necrosis following the use of multiple capsules. The method has proved to be one easily applied to all patients, and it is not too elaborate to be found practical in most clinics.

SUMMARY AND CONCLUSIONS

Analysis of statistics reported for corpus cancer shows that the best results are obtained from preoperative irradiation followed by hysterectomy. In radium treatment there are definite limitations to the use of an intra-uterine tandem alone. A method for using multiple capsules in the attempt to improve the distribution of radiation has proved to be one easily applied to all patients and not too elaborate for practical use in most clinics. There is evidence that infection is one of the factors contributing to increased radioresistance of cancer cells and to increase in the risk of necrosis following irradiation. In the attempt to lessen the amount of preexisting infection a preliminary course of x-rays should be used before the insertion of intra-uterine radium.

ABSTRACT OF DISCUSSION

DR. WILLIAM P. HEALY, New York: The authors describe a plan of intra-uterine distribution of radiation by means of multiple radium capsules in order to increase the distribution of radium throughout the cancer-bearing field in the uterus. It must be borne in mind that the cancer-bearing uterus is not a hollow structure like a balloon. It is an irregular cavity with tumor tissue projecting into it from one side or all sides or the top side, and it is a difficult matter in the majority of cases not to traumatize the interior of the uterus with foreign bodies. I have felt that about as efficient irradiation of the entire uterine cavity is obtained over an area 2.5 cm. distant from the central part of the cavity with the simple tandem applicator or multiple capsule in line as in a string, as with multiple foci pushed off to the sides. On the other hand, if the uterus is large and the entire carcinoma-bearing area cannot be irradiated in one treatment, I think then the Heyman (Stockholm) plan is better; in other words, divided treatments with capsules in line, three or four, to go from the external os to the dome of the fundus, and treatments given not closer than four weeks to one another. If one wants to give a total of 4,800 mg. hours, that should be divided into three treatments of 1,600 mg. each one month apart. The uterus will contract down between the individual treatments and satisfactory irradiation will be obtained in that manner. In addition, if one is dealing with a case in which there is a good deal of infection, it is the better plan to give small repeated doses at intervals. My associates and I have made 3,600 mg. hours with a tandem or a string of three capsules our minimum dosage if we are going to treat the patient with only a single dose preliminary to a hysterectomy. There are two types of corpus cancer histologically. One is amenable to cure by hysterectomy alone; the other, more malignant, requires preliminary irradiation plus hysterectomy. If the uterus is larger than a two and a half months gestation in size, we have found that the prognosis is bad with irradiation alone. If the uterus is smaller than a two and a half months gestation and the patient is a poor surgical risk, one can be reasonably sure of getting about 40 to 45 per cent five year cures with irradiation alone. In the larger uterus, therefore, regardless of the fact that the patient may be a bad risk, unless she has metastases I strongly urge hysterectomy.

DR. A. N. ARNESON, St. Louis: It is obvious that no single method of treatment can be applied to all patients. In the attempt to improve clinical results it is essential to individualize the treatment of each patient. The use of multiple capsules of radium presents a reasonably flexible technic for irradiating corpus cancer, which, in the most favorable circumstance, is a relatively difficult procedure. Further advance in methods of treatment may result in the administration of doses adequate for complete destruction of tumor in a greater percentage of cases. Gynecologists have at their disposal an opportunity for important clinical and laboratory studies. Careful observations on patients and on specimens removed after preoperative irradiation may contribute valuable data on the biologic properties of corpus lesions. It is also possible that knowledge obtained in that manner may be applied to other types of cancer.

SUPPRESSION OF LACTATION BY TESTOSTERONE

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Suppression of lactation in the puerperal breast frequently is desirable or necessary. After premature or still births, toxemia of pregnancy and some cesarean sections, when there is malformation or abscess of the breast or cracked nipples and in the presence of certain constitutional diseases, such as tuberculosis, diabetes and heart disease, there is valid reason to prohibit lactation. The measures employed for this purpose, until recently, were empiric and generally consisted of application of tight breast binders, with camphor liniment or belladonna unctions, restriction of fluids, saline purges and numerous other procedures of questionable value.

Kurzrok and O'Connell [1] first demonstrated that it is possible to inhibit lactation in women by administering androgen in the form of testosterone propionate. They reported successful results in 19 of 21 cases.

Birnberg, Kurzrok and Klor [2] later reported using testosterone propionate to inhibit lactation in a series

1. Kurzrok, Raphael, and O'Connell, C. P.: Inhibition of Lactation During Puerperium by Testosterone Propionate, Endocrinology **23**: 476-478 (Oct.) 1938.

2. Birnberg, C. H.; Kurzrok, Lawrence, and Klor, S. J.: Inhibition of Lactation During Puerperium by Testosterone Propionate, Am. J. Obst. & Gynec. **39**: 107-109 (Jan.) 1940.

of 56 cases, with successful results in 45. In 2 cases they gave doses of 100 mg. on the day of delivery, with complete inhibition of lactation.

TABLE 1.—*Cases in Which Suppression of Lactation Was Secured with Testosterone Propionate*

Case	Day Post Partum	Condition of Breast	Dose, Mg.	Observations
1	3d	Engorged	5	Relief in 12 hours
	4th	.....	5	Breasts slightly tender
	5th	.....	5	Breasts soft, not tender
2	4th	Engorged, tender	25	Definite relief in 12 hours
	5th	.....	10	Breasts softer
	6th	.....	10	Breasts soft, not tender
3	3d	Moderately engorged	10	Relief in 12 hours
	4th		10	No pain or tenderness, 24 hours
4	4th	Markedly engorged and painful	10	Relief in 2 hours
	5th	.....	10	Soft, not tender in 24 hours
5	4th	Engorged and painful	5	Relief in 12 hours
	5th	.....	10	Breasts soft, not tender
	6th	.....	5	Soft, slight secretion
6	3d	Engorged and painful	10	Definite relief in 2 hours
	4th	.....	10	Breasts softer
	5th	.....	10	Breasts soft; no secretion
7	3d	Engorged and tender	10	Some relief in 4 hours
	4th	.....	10	Breasts firm; moderately tender
	5th	.....	10	Definite relief
	6th	.....	10	Breasts soft, no secretion
8	3d	Engorged and tender	25 25 (8 hr. later)	Marked decrease in tenderness in 12 hours; no tenderness in 24 hours
9	4th	Engorged and painful	25 25 (8 hr. later)	Complete disappearance of pain and tenderness in 3 hours; breasts soft, not tender in 24 hours
10	2d	Engorged	25	Relief in 12 hours but continued engorgement
	3d	.....	25	Less engorgement
	4th	.....	..	Breasts soft, no tenderness
11	4th	Engorged and painful	25	Relief in 12 hours
	5th	.....	25	Soft, not tender; suppression of secretion
12	3d	Engorged and very tender	25	Relief in 4 hours
	4th	.....	25	Soft, not tender; no secretion
13	3d	Engorged and very tender	25	Relief in 6 hours
	4th	.....	25	Soft, not tender; no secretion
14	4th	Engorged and very tender	25	Relief in 6 hours
	5th	.....	25	Soft, not tender; no secretion
15	3d	Beginning engorgement	25	Continued engorgement and tenderness for 12 hours
	4th	.....	25	Soft, not tender; no secretion in 24 hours
16	3d	Moderately engorged	25	Definite relief in 12 hours
	4th	.....	25	Slight tenderness for 24 hours
	5th	.....	25	Soft, not tender; slight secretion on 8th day
17	3d	Engorged and very tender	25	Relief in 6 hours, but persistent engorgement
	4th	.....	25	Decreased engorgement in 24 hours; complete relief in 48 hours; breasts soft, not tender; no secretion
18	5th	Tender, slight engorgement, slight secretion	25	Complete relief of tenderness and engorgement in 12 hours; breast soft, slight secretion
	6th	.....	25	Breast soft, no secretion

Siegler and Silverstein[3] reported that in 50 cases lactation was suppressed successfully in 47 instances. They observed that pain in the breast due to congestion was the first symptom to disappear. They obtained uniformly good results with doses of 125 to 150 mg. These doses were higher than those employed by Kurzrok and O'Connell and much higher than was necessary in the cases we have studied.

3. Siegler, S. L., and Silverstein, L. M.: Use of Testosterone Propionate in Inhibition of Lactation During Puerperium, Am. J. Obst. & Gynec. **39**: 109-112 (Jan.) 1940.

CLINICAL RESULTS

Testosterone Propionate.—The effect of testosterone propionate [4] has been studied in a series of 25 cases, which have been grouped according to the functional status of the breasts. In the first, and largest, group, of 18 cases (table 1) the breasts were definitely engorged, tender and painful, and the administration of the testosterone propionate was begun on the third or fourth day post partum. The dosage was varied to determine, if possible, the minimum dose necessary to relieve the mammary engorgement and to suppress lactation. The doses ranged from 15 to 75 mg., with the largest quantity given at a single injection, 25 mg. The injection was repeated usually in twenty-four hours, but in 2 cases it was repeated in one hour and in 2 cases in eight hours. The tenderness and engorgement of the breasts were relieved promptly, sometimes dramatically, and in all cases lactation was suppressed within twenty-four to forty-eight hours.

In table 2 are shown the details in 4 cases in which lactation had been definitely established for variable periods. Doses which proved entirely effective in the cases shown in table 1 were injected at intervals of twenty-four hours, without appreciable effect in suppressing lactation.

In addition to the cases shown in tables 1 and 2, there were 3 cases in which 25 mg. of testosterone propionate was administered on the first day post partum, with repetition of the dose on the second and third days. The treatment failed in all 3 cases, and engorgement of the breasts occurred on the third to the sixth day after delivery.

Testosterone propionate also is useful clinically in relieving the pain and tenderness of engorged breasts in cases in which there is no desire to suppress lactation. Small doses (5 to 10 mg.) may be injected, and if nursing is continued at regular intervals lactation will continue with no evidence of diminished secretion.

Methyl Testosterone.—Although testosterone propionate injected subcutaneously was used in all the cases reported here, in a subsequent series of cases it has been found that methyl testosterone given orally in doses of 25 mg. at intervals of four hours or three times a day for six doses produces results comparable to those obtained with 50 to 75 mg. of testosterone propionate administered subcutaneously.

COMMENT

Our experience in 25 clinical cases would seem to indicate that the time at which the testosterone is administered distinctly affects the results of treatment. A dose of 50 to 75 mg. of testosterone propionate was effective in relieving mammary engorgement and in suppressing lactation in all cases in which it was administered at the beginning of lactation, that is, on the third or fourth day after delivery. When similar quantities were injected immediately post partum or after lactation had been established for some time, they were ineffectual.

The reason for the aforementioned results becomes clear in the light of facts that are known about the physiology of lactation and the effects of the male sex factor represented in testosterone propionate.

Throughout active sex life there are cyclic changes in the breasts produced by the influence of ovarian hormones.[5] In the postmenstrual phase there is a

4. The product used was oreton, furnished by the Schering Corporation.

5. Procter, I. M.; Carpenter, C. C., and Morehead, R. F.: The Relation of Chronic Cystic Mastitis to Malignancy, Surg., Gynec. & Obst. **70**: 671-678 (March) 1940.

regressive change, in which the epithelium becomes quiescent and the connective tissue is active. After ovulation, when the corpus luteum forms, the breast enters a proliferative stage. The stroma softens and the epithelium becomes active; secretion appears in many of the ducts and distends them to produce the swollen, tender premenstrual breasts. These changes are in preparation for pregnancy and parallel the response of the endometrium to the ovarian hormones. When pregnancy ensues, one of the earliest maternal changes is the increasing fullness and tenderness of the breasts. Under the influence of the persistent corpus luteum the epithelium of the breast continues its activity at the expense of the connective tissue. Many new acini are formed from the budding ducts, and fat is replaced by the abundant epithelial tissue.

Hildebrandt [6] has suggested that the placenta elaborates a substance which stimulates the growth of the mammary gland and at the same time inhibits lactation. Werner [7] expressed the belief that the ovarian hormones which are present in unusual quantities during pregnancy produce mammary proliferation but inhibit the action of the anterior pituitary lactogenic hormone. With Collier,[8] he found that activity of the breasts occurred in 13 castrated girls treated with estrone (theelin).

After delivery there is a rapid withdrawal of the ovarian estrogenic factors, which act as inhibitors of the hypophysis. Freed from these inhibiting factors, the anterior lobe of the pituitary gland produces prolactin (Riddle), which stimulates the secretion of the mammary ducts and initiates lactation, usually about forty-eight hours after delivery.

The continuation of lactation is dependent on peripheral stimulation or suckling, as has been shown by the work of Selye.[9] He cut the main galactophore at each of the nipples of 7 lactating rats. The mothers were returned to their litters, and since none of the nipples yielded milk the young nursed them all to the same extent. In a control series, the litters were removed from 10 rats on the third day of lactation. All animals were killed three to fourteen days after the beginning of the experiment. In the first group, in which the milk ducts were cut, the mammary glands were turgid with large quantities of milk even on the fourteenth day, while in the control group the glands contained no milk after three to five days and the alveoli began to disappear after the sixth to the eighth day.

In view of the foregoing facts, it is easy to explain the results reported in our clinical cases. The testosterone propionate in the doses employed was effective in suppressing lactation only when the estrogenic factors which inhibit mammary secretion during pregnancy had ceased to function and before regular lactation had been established through the stimulation afforded by suckling. The influence of such stimulation would account for the failure of treatment to suppress lactation in the 4 cases recorded in table 2, in which lactation had been well established by nursing for a considerable period. The failure in 3 additional cases, in which moderate doses of testosterone were administered immediately post partum, can be explained by the fact that in these quantities the testosterone probably was eliminated by excretion by the time the pituitary-inhibiting factors of the ovarian hormones had been removed from the circulation and hence was not present in sufficient quantity to inhibit the onset of secretion.

Our failure to suppress lactation by administering testosterone immediately post partum, as contrasted with the success reported by Birnberg, Kurzrok and Klor [2] in 2 cases in which they administered 100 mg. on the day of delivery, may thus be accounted for in the light of experiments performed by McCullagh, Rumsey and Cuyler.[10] They found that when testosterone propionate was injected into males with hypogonadism the urinary androgens rose in proportion to the dose. After a single moderate dose the increased secretion lasted for only twenty-four hours, while larger doses effected an increase for several days. This prolonged effect of larger doses probably would account for Birnberg's [2] findings.

In normal males, McCullagh and his co-workers [10] found that the injection of testosterone propionate caused a prompt increase in the excretion of androgenic material. This was followed by a period of subnormal androgenic excretion, with return to normal after a few days. They expressed the belief that this period of subnormal excretion probably represents a period of pituitary depression caused by the injection of testosterone.

TABLE 2.—*Cases in Which Testosterone Propionate Failed to Produce Suppression of Lactation*

Case	Day Post Partum	Condition of Breast	Dose, Mg.	Observations
1	8th	Secreting	25	Slight lessening of secretion
	9th	.....	25	Continued secretion
	10th	.....	25	Some reduction, but not suppression of secretion
2	60th	Secreting	10	Slight lessening of secretion
	61st	Engorged	10	Marked engorgement of breast in 24 hours; lactation continued but was definitely decreased
3	61st	Secreting	10	No change
	62d	.....	10	No change
	63d	.....	10	Continued to lactate
4	8th	Secreting and tender	25	Disappearance of tenderness in 6 hours; secretion continuing at end of 24 hours
	9th	.....	25	No change in secretion
	10th	.....	..	Definite diminution in secretion but lactation continued; breasts much softer and not so full

It would appear, then, from our studies and the other clinical work reported that the pituitary depression caused by moderate doses of testosterone administered at the initiation of the secretory phase of the breasts is sufficient to inhibit the lactogenic function of the pituitary gland and to suppress lactation.

SUMMARY AND CONCLUSIONS

In 18 of 25 cases in which the preparation was administered at the beginning of lactation (approximately forty-eight hours after delivery), a dose of 50 to 75 mg. was effective in all instances. Similar quantities of testosterone were not effective in suppressing lactation in 4 cases in which lactation was definitely established when treatment was begun and in 3 cases in which testosterone was administered immediately after delivery.

6. Hildebrandt, P.: Zur Lehre von der Milchbildung, Beitr. z. chem. Physiol. u. Path. **5**: 463-475, 1904.
7. Werner, A. A.: Lactogenic Hormone: Severe Reactions from Its Use, Endocrinology **24**: 119-121 (Jan.) 1939.
8. Werner, A. A., and Collier, W. D.: Effect of Theelin Injections on Castrated Woman with Histologic Report, J. A. M. A. **100**: 633-640 (March 4) 1933.
9. Selye, Hans: Nervous Control of Lactation, Am. J. Physiol. **107**: 535-538 (March) 1934.
10. McCullagh, E. P.; Rumsey, J. M., and Cuyler, W. K.: Excretion of Urinary Androgens Following Injection of Testosterone Propionate, Endocrinology **24**: 833-837 (June) 1939.

From these findings it may be concluded that testosterone propionate administered subcutaneously in quantities of 50 to 75 mg. over a period of two to three days at the initiation of the secretory function of the breast is effective in suppressing lactation.

Smaller doses (5 to 10 mg.) may be administered to relieve the pain and tenderness in the engorged breast without diminution of secretion provided nursing is continued at regular intervals.

Methyl testosterone administered by mouth in doses of 25 mg. at intervals of four hours for six doses produces results comparable to those obtained with 50 to 75 mg. of testosterone propionate administered subcutaneously.

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NEPHRITIS IN SCARLET FEVER AND ITS TREATMENT

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During the eruptive phase of scarlet fever the urine rarely shows more than a trace of albumin, a few granular casts and possibly a few leukocytes and red cells. This relatively mild inflammation of the kidneys usually subsides with the rash and fever and requires no treatment other than that generally applicable to the disease itself. The fact that this initial renal inflammation responds to the early use of scarlet fever antitoxin is evidence of its being due to the direct action of the erythrogenic toxin.[1]

Glomerulonephritis may occur during the eruptive stage, but the great majority of severe cases take place late in the convalescence [2] and often when the initial rash and fever have been so extremely mild [3] as to be without any signs of the benign renal disturbance which I have just mentioned.[4]

It is impossible to consider here the physiologic mechanism of the origin of glomerulonephritis in scarlet fever and the many theories which have been expounded with regard to it. However, it is worthy of mention that indirect evidence has been accumulating in support of the idea than an intense antigen-antibody reaction is connected with the origin of glomerulonephritis in this disease.[5] We must confine ourselves here to a few pertinent observations.

Lyttle [6] found that the Addis sediment count of the urine was increased during the convalescent stage in fourteen cases of scarlet fever, yet the normal count showed wide variations.[7] In a study of 202 children convalescing from scarlet fever, Calvin and Carbone [8] found a positive orthotolidine test in ninety-nine, or 44 per cent. These observations suggest that some degree of inflammation is frequently present during the late stage of scarlet fever. In line with this is the finding of positive nephrotoxic serum reactions in 92 per cent of scarlet fever patients studied by Schwentker and Complozier.[9]

Gunn and Griffith [10] found that one group ("type 2") of scarlet fever streptococci in the nose and throat cultures was particularly apt to be associated with nephritis, but the series studied consisted of only 100 cases, and this observation has not been confirmed or refuted by further studies. Streptococci are but rarely found in the urine [11] or in the blood [12] during the acute glomerulonephritis. In a case of severe acute hemorrhagic nephritis arising on the thirteenth day and complicated with bacteremia, Chapman used chemotherapy effectively along with other measures to bring about recovery.[13] The routine use of sulfanilamide in scarlet fever does not induce nephritis.[14] However, this drug and its allied compounds may be precipitated in the renal pelves and give rise to hematuria.

Lichtenstein [15] found nephritis more common in cases treated in the open ward than in those cared for in strictly isolated cubicles. This finding conformed to the increased incidence of other complications in the open ward. Nephritis is less common in the warmer months of the year when there are less of those mixed infections which predispose to activation of residual streptococci. It is most common in childhood and in later life.[16] A strong family predisposition has been demonstrated in certain epidemics studied in this respect.[17]

The onset, indicating severe renal damage, may be gradual, yet it may be without warning in the routine urinalysis of the previous day. In its "explosive character" [18] the onset resembles that of purpura haemorrhagica, a more rare but at times an equally serious complication of the convalescent stage.[19] The latter phenomenon is purely a vascular one, but we must not lose sight of the fact that the nephritis, both in its early and in its late forms, is associated with local and remote vascular disturbances.[20] The onset of the renal symptoms frequently coincides with a renewed activity of the streptococcus in the throat, cervical lymph glands, sinuses, middle ear or mastoid.

The relationship of these septic foci to glomerulonephritis has been the subject of much speculation. Suffice it to say that glomerulonephritis may occur in the absence of any evidence that a septic focus exists. On the other hand, Friedemann [21] reports three cases

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Read in the panel discussion on Some Contagious Diseases before the Section on Pediatrics at the Ninety-First Annual Session of the American Medical Association, New York, June 13, 1940.

1. Dick, G. F., and Dick, Gladys H.: Scarlet Fever, Chicago, Year Book Publishers, Inc., 1938, p. 44.

2. Longcope, W. T.: The Pathogenesis of Glomerular Nephritis, Bull. Johns Hopkins Hosp. **45**: 335 (Dec.) 1929. Weaver.[22] Neu.[4]

3. The late appearance of a glomerulonephritis may occur in individuals immune to the toxin who show merely a sore throat but no rash, or it may follow equally late after the tonsillitis due to nonscarlatinal strains. Glomerulonephritis has been subdivided into acute focal glomerulonephritis of bacteremic origin and acute diffuse glomerulonephritis (Longcope [2]), the postinfections form encountered late in the convalescence of scarlet fever. The clinical differentiation of these forms is sometimes impossible, especially as they may be in combination. Furthermore, the treatment remains symptomatic in both.

4. Neu, Walther: Klinischer Beitrag zu den Nierenerkrankungen bei Scharlach, Zentralbl. f. inn. Med. **60**: 577, 593, 1939.

5. Theneie, C. L.; Cenci, V. P., and Hirshberg, M. S.: Scarlet Fever, Arch. Pediat. **51**: 615 (Oct.) 1934. Arnott, W. M.; Kellar, R. J., and Matthew, G. D.: Experimental Glomerulonephritis Produced by Use of Specific Sera, Edinburgh M. J. **43**: 233 (April) 1936. Duval, C. W., and Hibbard, R. J.: Scarlatinal Nephritis Experimentally Induced in the Dog, Proc. Soc. Exper. Biol. & Med. **24**: 876, 1927. Longcope,[2] Peters,[23] Friedemann and Deicher,[15] Escherich and Schick,[17] Pospischill and Weiss,[18] Box,[19] Schwentker and Complozier.[9]

6. Lyttle, J. D.: Addis Sediment Count in Scarlet Fever, J. Clin. Investigation **12**: 95 (Jan.) 1933.

7. Snoke, A. W.: The Normal Addis Sediment Count in Children, J. Pediat. **13**: 473 (April) 1938.

8. Calvin, Joseph K., and Carbone, Joseph: Erythrocytes in Urinary Sediment in Health and in Disease (Scarlet Fever): Studies by the Orthotolidine Test, Am. J. Dis. Child. **57**: 1035 (May) 1939.

9. Schwentker, F. F., and Complozier, F. C.: The Production of Kidney Antibodies by Injection of Homologous Kidney Plus Bacterial Toxins, J. Exper. Med. **70**: 223 (Sept.) 1939.

10. Gunn, W., and Griffith, F.: Bacteriological and Clinical Study of One Hundred Cases of Scarlet Fever, J. Hyg. **28**: 230 (Dec.) 1928.

11. Friedemann, U., and Deicher, H.: Weitere klinische und experimentelle Untersuchungen über den Scharlach, Ztschr. f. klin. Med. **108**: 737, 1928. Longcope.[2] Peters.[23]

12. Longcope.[2] Peters.[23]

13. Chapman, A. W.: The Treatment of the Bacteremia of Postscarlatinal Nephritis with Prontosil and Prontylin, Arch. Pediat. **55**: 560 (Sept.) 1938.

14. Wesselhoeft, Conrad, and Smith, Edward C.: The Use of Sulfanilamide in Scarlet Fever, New England J. Med. **219**: 947 (Nov. 5) 1938.

15. Lichtenstein, A.: Studies in Scarlet Fever: IX. A Note on the Effect of Individual Isolation on the Course and Complications of Scarlet Fever, Acta pediat. **12**: 95, 1931.

16. Weaver, G. H., in Abt, I. A.: Pediatrics, Philadelphia, W. B. Saunders Company, 1925, vol. 6, p. 338.

17. Escherich, Theodor, and Schick, Béla: Scharlach, Vienna, 1912, pp. 118-119.

18. Pospischill, Dionys, and Weiss, Fritz: Ueber Scharlach (der Scharlacherkrankung), Berlin, S. Karger, 1911, p. 137.

19. Box, C. R.: Complications of the Specific Fevers: Lumleian Lectures, Lancet **1**: 1217 (June) 1933. Gibson, A. G., and Hobson, F. G.: Hemorrhagic Purpura Following Scarlet Fever: Report of Two Cases in One Family, ibid. **1**: 509 (March 5) 1932.

20. Peters, J. P.: Some Factors in the Etiology of Bright's Disease, New England J. Med. **212**: 653 (Oct. 3) 1935.

21. Friedemann, U.: Das Scharlachproblem, Klin. Wchnschr. **7**: 2277 (Nov. 25) 1928.

of persistent hemorrhagic glomerulonephritis after scarlet fever in which the extraction of obviously diseased tonsils was followed by prompt clearing of the symptoms of nephritis. He warns against this operation in the acute stage. Others,[22] including myself, have seen recovery follow tonsillectomy after the acute stage of the nephritis has subsided, but this result is not always to be expected. Indeed, one should not be too ready to incriminate the tonsils, as is brought out by the recent study of Illingsworth[23] on the relation of tonsillectomy to nephritis in childhood.

I have investigated the incidence of nephritis in patients with and without tonsils at the Haynes Memorial Hospital. Over the period of time covered by 1,000 patients who were admitted for scarlet fever with their tonsils intact, there were 200 instances of scarlet fever in patients whose tonsils had been extracted prior to admission. The cases in the two groups were equalized as to age groups and seasons of the year, and no cases were included which showed complications on admission. The incidence of acute nephritis was 1.7 in those who had their tonsils in and 1.5 in those whose tonsils had been previously removed. Thus the difference was insignificant. In all fairness it is pertinent to remark that the tonsillectomized patients presumably had had defective tonsils and that they might not have fared so well had their tonsils been in during the scarlet fever.

The literature on scarlet fever fairly teems with conflicting notions regarding dietary causes of nephritis. Because albumin was found in the urine in nephritis, scarlet fever patients were forbidden eggs and meat; in fact, some were kept largely on milk. Thirty years ago it was shown that a prolonged milk diet was entirely ineffective in preventing nephritis and that patients actually fared better in general on a mixed diet containing eggs and meat during the postfebrile stage.[18] This has been subsequently confirmed.[24] These results were immediately explained on the ground of the protein content in the milk. As warnings against protein were dispelled, the dangers of fats were brought to the fore. The milk fat was then incriminated as an explanation of the poor results of the milk diet. A warning was given even against cod liver oil because of the fat. Next came a warning against potatoes because of the potash content—another example of dietary deprivation on unwarranted speculation, a common form of therapeutic tyranny. Today most scarlet fever patients enjoy a liberal diet consistent with their age. Salt, eggs and meat in reasonable quantities are now permitted during convalescence. In fact, diet as a cause of scarlet fever nephritis is an obsolete theory, except that an impoverished diet predisposes to all the complications of this disease, including nephritis.

Eight years ago Osman's method of administering alkali with the idea of preventing nephritis was used by Peters[25] with apparent success in a series of cases in England, but in 1937 the same author, in conjunction with Cullum,[26] proved its inefficacy during an epidemic in which nephritis was prevalent. The incidence of nephritis in cases treated with Osman's method was 4.3 per cent and in the controls 4.1 per cent.

The fact must not be lost sight of that true nephritis is actually an infrequent complication of scarlet fever. The incidence reported from hospitals is, of course, higher than in the general run, since many cases are referred to the hospital because of the nephritis.[27] If we exclude all those cases admitted because of nephritis, we find an average of about 1 per cent, with wide variations in different epidemics ranging as high as 7 per cent.[28] In fact, in one epidemic in Poland an incidence of 19 per cent was reported.[17]

The symptoms, prognosis and treatment do not differ from glomerulonephritis of non-scarlet fever origin: vomiting, fever, polymorphonuclear leukocytosis, albuminuria, granular and hyaline casts, merging into hematuria, with edema first appearing in the face, often but not always hypertension, an increase in the nonprotein nitrogen content of the blood, anuria and finally uremia, which occurs in about 20 per cent of the nephritis cases. The prognosis is gaged by the severity of these signs and symptoms and their duration. If the condition clears promptly, the kidneys are not permanently affected. Prolonged albuminuria is a bad sign, but this must always be differentiated from orthostatic albuminuria. While cases of protracted glomerulonephritis do go on to complete recovery, there are some that go over into the progressive type.

Nephritis in Nontonsillectomized and Tonsillectomized Patients with Scarlet Fever

Concurrent series of equal age groups over the same period at Haynes Memorial Hospital:

	Number of Cases	Nephritis, per Cent
Patients with tonsils	1,000	1.7
Patients without tonsils	200	1.5

In the treatment, one must keep in mind not only the condition in the kidneys but the conditions set up elsewhere in the body. The kidneys need rest, but this can be carried to extremes in the curtailment both of fluids and of nutrition. Dehydration is to be avoided, and 5 or 10 per cent dextrose intravenously may be indicated in spite of edema if the patient refuses liquids or is vomiting. In fact, intravenous dextrose solution is the best means of promoting diuresis. Diuretic drugs are best avoided. In my experience the condition of uremia itself is not benefited by bleeding. Even with an alarmingly high concentration of nonprotein nitrogen, creatinine and urea in the blood, the glomeruli may regain their normal function under conservative care.[29]

22. Underwood, E. A.: Early Nephritis in Scarlatina, Brit. J. Child. Dis. **28:** 114 (April-June) 1931. Hunt, G. P.: A Survey of Tonsillectomy and Adenoidectomy in Scarlet Fever, New England J. Med. **212:** 665 (April 11) 1935. Alport, A. C.: Focal Sepsis as a Cause of Nephritis, Lancet **1:** 1247 (June 11) 1932.

23. Illingsworth, R. S.: Tonsillectomy and Nephritis of Childhood, Lancet **2:** 1013 (Nov. 11) 1939.

24. Jochmann, Georg: Lehrbuch der Infektionskrankheiten, Berlin, Julius Springer, 1924, p. 728. Gerstley, J. R.: Der Beziehung der Diät zu Verlauf, Bluthefund und Nephritis beim Scharlach, Monatschr. f. Kinderh. **12:** 121, 1913.

25. Peters, B. A.: The Prevention of Renal Complications Following Scarlet Fever, Practitioner **139:** 614 (Nov.) 1932.

26. Peters, B. A., and Cullum, I. M.: Postscarlatinal Nephritis: A Study in Prevention, Brit. M. J. **1:** 1020 (May 15) 1937.

27. In 10,000 cases of scarlet fever treated at the Haynes Memorial Hospital there were 232 cases of nephritis (2.32 per cent). One half (112) of these cases were admitted during convalescence because of severe nephritis. Neu[4] had forty-four cases of glomerulonephritis in 1,845 cases of scarlet fever. Among these forty-four there were eleven admitted because of the nephritis. In addition there were five cases of "acute interstitial nephritis" due to bacteremia, all of which had a fatal termination, the diagnosis being established by autopsy.

28. Hunt, L. W.: The Treatment of Scarlet Fever with Antitoxin, J. A. M. A. **101:** 1444 (Nov. 4) 1933. Place, E. H.: Treatment of Scarlet Fever, New England J. Med. **205:** 225 (July 30) 1931. Joe, A., and Williamson, A. B.: A Note on a Severe Type of Scarlatinal Nephritis, Edinburgh M. J. **33:** 49 (Feb.) 192[ ]. Neu,[4] Escherich and Schick.[17]

29. The recent studies of Smith and his associates (Chasis, Herbert, and Smith, Homer W.: The Excretion of Urea in Normal Man and in Subjects with Glomerulonephritis, J. Clin. Investigation **17:** 347 [May] 1938. Chasis, Herbert; Rogers, Hilbert A.; Goldring, William, and Smith, Homer W.: The Control of Renal Blood Flow and Glomerular Filtration in Normal Man, ibid. **17:** 683 [Sept.] 1938. Smith, Homer W.: New Aspects of Renal Physiology, J. Urol. **41:** 867 [June] 1939) show that the elevation of blood urea in glomerulonephritis results from decreased filtration along with decreased reabsorption. "As the capacity to reabsorb water is impaired by disease, the fraction of urea reabsorbed decreases, so that the urea clearance approaches the rate of glomerular filtration" (Chasis and Smith).

Blackfan and McKhann [30] have pointed out a condition which is often confused with uremia but which is unrelated to the retention of nitrogenous end products. I refer to the cerebral edema which may result from acute glomerulonephritis. Cerebral edema brings about a rapid rise in the blood pressure with severe headache, blurring of vision, vomiting, often a slowing of the heart and respiration, convulsions and coma. Magnesium sulfate by mouth in doses of from 1 to 2 ounces (30 to 60 cc.) of a 50 per cent solution has proved of value in relieving these cerebral symptoms. In emergency it may be given intramuscularly, 0.2 cc. of a 25 per cent solution per kilogram of body weight, repeated every four to six hours, as the symptoms require,[31] in conjunction with the oral administration of the salt.

In the absence of cerebral edema the possible disadvantages of magnesium sulfate and other saline laxatives need due consideration. Cardiac decompensation may become an important factor, and this condition calls for digitalis. It is well to keep the patient warm, but it is neither necessary nor advisable to try to keep him bathed in sweat. Fruit juices at first, followed later by the addition of milk and cereals, form the accepted diet. As improvement takes place, the diet is gradually increased in quantity and variety to that consistent with the normal needs of the age of the patient. Hypotheses running counter to established clinical experience should never be allowed to supersede the physiologic and pathologic problems presented by the individual case.

30. Blackfan, K. D., and McKhann, C. F.: Acute Glomerular Nephritis in Children: Treatment of Cerebral Manifestations, J. A. M. A. 97:1052 (Oct. 10) 1931.

31. Ellis, L. B.: The Treatment of Bright's Disease and Related Renal Infections, New England J. Med. 210:821 (May 13) 1937. Blackfan and McKhann.[30]

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THE CHILD-PARENT RELATIONSHIP

THE CHILD IN THE FAMILY

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During the earlier years of the practice of pediatrics as a specialty it was entirely natural for the main emphasis to fall on the physical care of the child, since with few exceptions only sick children were brought to the pediatrician. Then too, in that not so distant day, parents had fewer problems than they face today. As yet no doubt had arisen in their minds concerning their absolute authority over their children. While "Spare the rod and spoil the child" has been found to have limitations, it has the great virtue of simplicity and produced results in many generations of men that may well cause us to give some earnest thought to the values of parental authority as a sound teaching method even though we have found better means for its exhibition. It is said the Dutch early discovered that a blow on the bottom of a child let knowledge in at the top. This is not a plea for the return of frequent corporal punishment, but we want to bring out clearly the absolute necessity for the exercise of reasonable authority by the adult in any relationship he may have with a child for whom he cares. All lives must be divided between the things we like to do and those we must do. We would like to give every one as many as possible of the things one likes to do, but if we give one too many of these and one neglects the things one should do too much one cannot become a useful, emotionally stable, self-disciplined and, therefore, a happy human being.

Young, inexperienced parents who are taught to understand the ways of children and are thereby able to manage them skilfully with a minimum of friction and worry grow naturally in the direction of grace and wisdom. On the other hand, the worry that always accompanies lack of knowledge and skill accentuates their own faults of character and lack of emotional development and any incompatibilities that happen to mar their married relationship. For example, if either is a selfish person his self-centered attitude becomes more pronounced as he defends himself against the unnecessary fear, fatigue and feeling of futility which his blundering, uninstructed attempts at carrying out his parental duties bring in their train. However, when he is helped sufficiently, especially while he is in the happy glow of pride that accompanies the birth of his child, to be reasonably successful, he is caught up and carried along by the tide of his success into a happy state of mind that even enables him to brag most inordinately about his "good child" and by inference his own virtues when he talks with his less fortunate peers.

The physician who talks with parents when their children are young has the best opportunity to help them establish a satisfactory family life. Parents' attitudes are not formed or have not yet become so fixed that they cannot be improved. We therefore present in this paper some of the methods by which we attempt to instruct and help the parents who consult us concerning their children.

Nearly all these children are brought to us because some concern for their physical well-being has arisen in the minds of their parents. However, the physical welfare of the child, primary and fundamental though it must always remain, must be only one of the chief concerns of those who guide the lives of children.[1] In order to emphasize this thought to parents we often say "It is far better to be a reasonable, lovable human being who can live happily with his fellows, even though his health isn't altogether perfect, than to be the healthiest 'animal' in creation."

FATHER'S PLACE IN THE FAMILY

From the beginning the parents must clearly understand that the admission of a new member to the circle demands readjustment of all the existing relationships between or among those who constitute the family. True enough, the family forms a natural group, and since at first the newcomer, being an infant, demands but little, the adjustments are simple and, if understood, are easily made. However, since they are beginnings, they are singularly important. A complete family life demands an actively participating father. Financial responsibility is not enough. He must grow in that wisdom which alone makes possible an understanding of the nature of a growing child and which can be learned only by those who share deeply and constantly in the care and upbringing of children. At the beginning, while the young father's pride is at the full, is the time to draw him into the newly expanded family life rather than to exclude him with that all too often used caustic remark "Get on out of here, you don't

1. Sweet, Clifford: Opportunities in Pediatric Practice, J. A. M. A. 111:893 (Sept. 3) 1938.

know anything about a baby," merely because he expresses some of the foolish ideas about children which seem to be an inescapable, though fortunately a temporary, part of that gigantic expansion of the ego which comes to every man each time he becomes a full-fledged member of the ancient and honorable order of fathers. We know of no greater service any pediatrician can do than to start two young, inexperienced parents working together more closely and harmoniously than they might otherwise do. We therefore make opportunities to talk with the father and encourage him to consult us for an explanation of any of our rules or ideas of which the underlying reason is not readily apparent to him and offer ourselves as arbiters in all differences of opinion that arise between parents and even those that emanate from the grandparents.

MATERNAL FEAR

Every mother must be encouraged after the birth of her first infant to control her fears that her infant may be too fragile to live. This must be done by truthfully reporting to her or letting her observe careful, complete physical examination of her infant as the basis for assurance that her baby is entirely normal. Her fears cannot be allayed if she has even a suspicion that her child's physician has taken her infant with too casual an attitude. Next her fears must be discussed in perfect frankness and friendliness so that she admits them freely and without shame. This she can easily do, once we have convinced her that such fears are in no way peculiar to her but have been in similar measure the lot of every woman who has known the joy of motherhood. Once any fear ceases to be regarded as an evidence of one's own weakness and, therefore, shameful and is recognized as a universal reaction of all mankind to similar circumstances, it loses its importance to a remarkable degree.

CRYING

Every child cries more or less and some cry more than others, just as some fathers swear more than others. If parents understand this and therefore seek by intelligent investigation to diminish crying to its lowest reasonable level, the beginnings of sound psychologic adjustments are firmly laid. On the other hand, if the parents are not taught by long and careful effort to understand the true meaning of their infants' crying, their state of mind is clearly revealed by "My baby cries because he is bad," and the beginnings for an unpleasant and unfortunate relationship are formed. Crying is for some time after birth the baby's only means of attracting attention to his needs and desires. Therefore, until he acquires other means of announcing his needs or demanding his fair share of the attention and his other rights as a member of the family, he must perforce rely entirely on his ability to cry, a clear demonstration, we submit, of a highly intelligent use of very limited resources rather than of original or any other kind of sin. Crying, like all other disagreeable behavior, is used by an intelligent child as his chief method of gaining his desires and needs after more grown-up methods, such as speech, should be substituted for it, only as it continues to be his most effective method.

INDIGESTION ("COLIC")

Any baby may be made uncomfortable by his digestive tract. While we have no accurate method of measuring the amount of his discomfort, we use this term rather than pain advisedly. In all probability it is only those children who have actual spasm of the pylorus or other regions in the digestive tube due to hypersensitivity to some of their food intake who suffer discomfort which is of a degree that reaches actual pain.[2] Every reasonable effort must be made to relieve his discomfort, but beyond this he must bear the irreducible minimum with fortitude as part of the common human lot in which no one can be constantly comfortable or always happy. Even at his tender age he must begin to learn that he cannot inflict those about him with his most disagreeable behavior whenever he is uncomfortable. Then too we must emphasize that the discomfort of indigestion or that which comes from overeating is not relieved by being constantly carried about. Also, since we have no way of measuring the discomfort of another, it is absolutely necessary to find out by observation how much of the baby's outcry is due to discomfort and how much of it is his natural desire for attention at the time of his choosing. Since crying is entirely harmless to any infant, he must be allowed to cry it out. Only in this way can the approximate level of his discomfort be distinguished from his demands for attention and from the irritability of his immature and easily fatigued nervous system which is produced by too much handling, too prolonged overstimulation from association with older members of the family and too little rest.

REGULARITY

There can be no doubt that a regular schedule is the most efficient and least wearing way of performing a regularly recurring task. Consequently, parents should be encouraged to follow a regular schedule, although regularity must be so tempered with reason that it serves them rather than that they become the servants of regularity. However, the greatest effect of regularity is the peace that it brings to the parents' minds and the discipline which it begins in the mind and character of the child. When any one discovers that all one's wishes are not the law of the family, one begins to realize for the first time that the wishes of others must be taken into consideration. Fortunately also one soon becomes accustomed to the schedule and is far happier than one would otherwise be.

CHANGE OF PROGRAM

Any departure from a regular program, if displeasing to the child, will be resisted vigorously, while if it is pleasing he will seize on it and attempt with all his powers to make it permanent. Daily we hear from parents "Doctor, he was all right until I attempted to give him coarser food or until I put him into a new bed or until, after letting him sit up late during that hot spell, I went back to his old time as the weather cooled or until he awakened in the night and I took him into my bed or until we visited his grandparents or until he wouldn't eat and I coaxed him, and, Doctor, I've had to coax him or amuse him ever since[3] or, most frequently, until he became ill (perhaps with a minor illness), since which time he demands all the immunities and privileges of a permanent invalid or else he won't follow any of my wishes."[4] So it goes, until, until, until, until it has become apparent to us that a graphic picture of any human life can be drawn with two intersecting lines to represent roads or ways of life with the town of "Until" marking the crossroads. The human

2. Stafford, Henry E.: Abdominal Allergy in Children, California & West. Med. 36:168-172 (March) 1931.
3. Sweet, Clifford: My Child Won't Eat, Arch. Pediat. 47:582-588 (Sept.) 1930; Voluntary Food Habits of Normal Children, J. A. M. A. 107:765-767 (Sept. 5) 1936.
4. Sweet, Clifford: Infection and Behavior, Arch. Pediat. 49:190-194 (March) 1932.

being going along the main well traveled familiar way of early life arrives at "Until," when he must turn aside to a more grown-up and therefore less familiar and more arduous route, into which he must be led and helped over with affection, understanding, skill and persistence. Or some circumstance, for example illness, brings him to an "until" which has no permanent place on the map of life, a mere tent city, to which, after a side excursion, he must return and again follow the main highway. He may find the excursion pleasant and have a strong desire to retain permanently all the perquisites which were temporarily entirely within his rights. If this is so he must be taken by the hand with the same love, understanding and, above all, persistence and his feet again set firmly on the main road.

DIFFICULT BEGINNINGS

So one may think of all education as a departure from an old road, a change of route. Any individual may find great, even seemingly unsurmountable, difficulties at a beginning which for others may be too easy to attract more than passing attention. If, in the face of his difficulty, he is too suddenly forced, shamed or given an opportunity to use his apparent inability as a means of gaining pity, sympathy, attention or some other desired advantage or, even as Job of old, to gain distinction by cursing the day of his birth, long lived or permanent disability may result. This long life or permanence rests on the real difficulty plus the belief that the difficulty is unsurmountable, and often on its value as an excuse to follow the easier path, thus avoiding other related or unrelated difficulties that arise later. On the other hand, if the beginning is made so easy that at least reasonably good results can be accomplished and, as skill is increased, gradually increasing effort is demanded, soon the desired goal or at least a satisfactory level of accomplishment is reached without conflict and with an increased self confidence which is altogether the best equipment for further advance toward successful living. As a single example let us consider the necessary change from liquid to solid food. Most children welcome the change if it is not too abrupt, others can easily swallow very coarse particles with surprising ease, while still others are literally choked by the uncontrollable (probably reflex) reaction set up in their throats by the very texture of the newly offered food. Members of this last group are often brought to us as late as 5 or 6 years of age as "bad children, who will not eat any solid food." When any child has difficulty, he should be met on the ground of his own choosing, not for battle but for training. The new food having been made as fine and as smooth as he wishes, should very gradually be changed to the texture and consistency desirable for his age, having in mind that individual tastes often vary throughout life in the size of the food particles one swallows, and Alvarez [5] has recently denied the increased nutritive value of "fletcherized" food whether the process of trituration is carried on before or during eating.

BASIS OF PARENTAL AUTHORITY

That parents should constantly exercise authority over their children becomes axiomatic when one gives it thought. The parents have all responsibility and the children none. Responsibility without the support of adequate powers cannot be borne long by any one without inevitable failure to endure its weight or to make constructive use of it. The choice of a leader is soundly based, in large measure, on his experience in the field into which advance is proposed. Since life remains entirely unexplored and unknown to the child, he needs the guidance of the more experienced adult. Intelligence develops with years of growth and certainly is a large and necessary part of the qualifications for leadership and authority. Every child begins life completely self centered, and only by long training and by the fundamental necessity of living successfully with other human beings does he begin to give thought to the wishes, rights and well-being of others. Every normal adult has advanced at least some way along the way of living with and influencing his fellow creatures, and, when he becomes a parent, usually his parental affection for his child carries him a long way toward generosity and consideration for his child.

We are moved within our own natures and lead others only as we develop our reason and learn to use fully but control wisely our emotions. Reason is a faculty which matures slowly only in the soil of a developing intelligence and increasing experience. Control of the emotions, a gradual tempering process in reason, experience and increasing intelligence is a function of growing up. In fact, the child possessed at birth of all the emotions must learn their use and control throughout his entire life time and the level of his attainment is the true measure of his adult stature, no matter how great his physical bulk and intellectual development may become.

There remains another reason, perhaps more important than any one of the others, for parental control of the child. All parents, unless they are indeed depraved individuals, love their child far more than the child loves them. The very young child clings to his adult attendants and feels his greatest security in their familiar presence, but in all probability beyond the satisfaction of his needs and the calming of his fears he gains emotional attachment to any individual slowly. This can hardly be doubted by any one who has seen a child transfer his allegiance after a few days to any one who is kind to him, and if his parent or usual attendant is absent for even a short time he is readily forgotten and is not restored to full favor at once. If parents are not warned that this lack of deep emotional attachment is in every child, they may think somehow they have failed to win the child's love and will consequently fail to discipline him wisely and when the child is old enough to say "Well, then I won't love you any more," the poor parent is thrown into a state of subjection which is detrimental to the whole child-parent relationship.

USE OF PARENTAL AUTHORITY

While parental authority is soundly based on the greater development of the adult, it must be used on reasonable, clearly defined principles if it is to produce such desirable results as the safety, discipline and best possible development of the child and at the same time win his respect, admiration, gratitude and lasting love for the parent. A decision which is made for adequate and valid reasons can be carried out against prolonged opposition and even violent emotional storms. On the other hand, a decision made with equal firmness and authority which arises without due thought or for the enforcement of which there is no real reason is abandoned so readily in the face of opposition that the parent may justly be thought inconsistent and the child is encouraged by victory to oppose all decisions that are

5. Alvarez, W. C.: An Introduction to Gastro-Enterology, New York, Paul B. Hoeber, Inc., 1939, p. 259.

distasteful to him by any and all means that he may find useful. At the same time the poor child fails to find the support he should gain from a familiar and reasonable discipline. So, confusion is added to confusion as he attempts to make his way along an as yet unfamiliar path in the company of parents whose behavior in two sets of identical or largely similar circumstances he cannot possibly predict.

A child should be free to follow his own desires except when some reason forbids that he should do so. For example, he may wish to play with a beautiful dish which is unbreakable but contains a deadly poison. His parent will not let him have it and will persist in his refusal to the point of physical restraint, unmoved by any kind of show the child may put on. However, when the dish is empty and there is no reason for the child not having it, all too often the parent says "No!" as promptly and sternly as he did when it contained poison. Then, when whining and crying, begging or a tantrum has annoyed him sufficiently, he says, with great irritation, "Oh! go ahead and take it, you bad child." Can any one honestly blame the child for trying every decision of his parents to see whether or not it will hold when he can so easily reverse many of them? Also can any one be even mildly surprised if the child who finds disagreeable behavior his most effective weapon continues using it so frequently in his after life that he brings much unhappiness on himself and others? Cannot any one understand the exaggerated importance of attaining the object of his desire when he has been aroused to a high emotional pitch by unnecessary opposition and the lasting impression produced by a final victory when it is his? Until they are taught or learn otherwise, nearly all parents answer "No!" too often and too readily in response to too great a number of the child's requests.

THE "NO" PARENT

There are many reasons for this too ready negative response to the child's wishes. The first arises from another of the fundamental differences between an adult and a child, a difference which is often annoying to the adult and which will wear his patience to the breaking point unless he fully understands that his child is behaving in a perfectly normal manner. The child is incapable of prolonged attention to or concentration on any single matter. Also, having no duties or responsibilities, his attention is held only as long as his naturally short-lived interest is stimulated. Consequently the adult with his greater powers of concentration and his need for completing necessary and many times unpleasant tasks is all too frequently annoyed and pestered by the child's incessant demands for attention and change of activity until his temper is short indeed. If the child is old enough to pull out drawers, turn on the gas, get into the toilet, break dishes or bric-a-brac or injure himself by burns, falls or in some other manner, the enormous strain on the nervous system of the mother while she attempts to work and at the same time keep her child out of mischief is more than any one can or should be subjected to. No wonder she is soon irritated beyond all reason as she jerks her child away from one thing after another and finally slaps his hands, to the accompaniment of the thought that she has a bad child and certainly is a failure as a mother. All because no one has explained to her that her child is a normal human being for his years, who, if he weren't active and eternally curious, could never be educated and that she cannot teach him "to let things alone" by commands and force. We often ask a distracted mother how well she thinks our secretaries and nurses could do their tasks if each at the same time had charge of an active child who had the run of the entire office.

The second in importance is that any adult needs refreshment; which comes only with release from being constantly in charge of a child. Every mother should have some regular time away from her child, and the father and mother should have as many times as possible during which they can return for a few hours at least to the direct dual relationship of their courtship and early marriage days with no one, not even their dearly beloved child, "between" them. Children who are put to bed regularly at an early hour are doubly fortunate. They get much needed physical rest and, more important, they have parents who, rested from their cares, are more reasonable and patient than they otherwise would be. Mothers must be encouraged to get away from their children with the assurance that they will be better mothers when they return and that the best mother must at the same time be the best wife. If the family budget or sensible available as well as obliging relatives do not allow the mother a reasonable amount of freedom, she can surely find another young woman in a like predicament who will care for the children of both in return for a like service at another time.

METHOD OF CARE FOR RUNABOUT CHILD

When the mother has tasks to perform, her child should be put in a safe place, perhaps a pen or a room with a gate across the door where he can see and be seen by his mother. Then while she does her work quickly and effectively her child begins to learn to rely more and more on himself. As the child learns to rely on himself, his periods of concentration grow in length and, more important still, he learns another part of that most valuable lesson which teaches him that he must shape his life according to the wishes of others as well as his own. He will soon learn to play contentedly by himself for reasonably long periods of time if his cries of protest are disregarded when he is first put into his pen or other place of safety and if they receive the same disregard when he renews them with all his might after some break in his routine, such as illness, a visit away from home, or after a visit from Grandmother, who just couldn't let "the poor little dear stay in that horrid old pen," or after father's day at home when he was taken for a walk at the usual hour of his lesson in self reliance.

The child can see no reason why he should not turn on the faucets and wet his clothing several times daily. Certainly to him turning on faucets cannot be other than a natural and usual act, since he sees both his parents do it many times each day. Also dabbling in water and starting it flowing as the result of his own discovery that he can do it are great pleasures. Therefore, when his mother is busy with other things he should be effectively kept away from the faucets, or when he has the run of the house, the water should be turned off below the basins that he can reach. It is also easy to keep him out of the bath room by placing a hook or other simple door fastener on the door above his reach. He should not, however, be denied the pleasure of turning on faucets and holding his hands in running water. A box of suitable height placed before the basin for the child to stand on while his

parent stands behind him with arms encircling him for safety from falling while he can plunge his hands into the water and experience the great delight of rubbing them together while they are covered with soap make getting washed a pleasure to all concerned. Contrast this with the scene made up of the irritable parent and the unwilling child being dabbed with a wash cloth while he struggles whenever he has a free hand to grab the forbidden faucet or the cake of soap, and the advantage of the first method will need no further exposition. If faucets and running water still give the child great pleasure, some of the voluntary attention to which every child is entitled may be profitably spent gratifying his desire.

METHOD OF DISCIPLINE

When the runabout child gets into mischief, such as climbing up to the sink filled with the breakfast dishes, he should not be scolded or slapped but should be removed to his usual safe depository as a matter of course without comment. Such an action, when done without an accompaniment of verbal threats and lamentations that a so virtuous parent can have a so depraved child, has an air of finality and accomplishes its sole purpose, namely the removal of the child to his own limited sphere of activity until his mother has time to give him attention.

Since throughout life, and especially during childhood, association of events with places is strong, it is unwise to punish a child by putting him into the place, such as his pen or his bed, where he is expected to spend much time alone in a reasonably happy state of mind. During early childhood only a few associations are present in the child's mind, but these few are strong, simple and direct. The place in which he is regularly given food soon becomes strongly associated with eating and he may be greatly disturbed by any change in its location or equipment. Nearly all children associate even their table implements with certain kinds of food and resist any attempt to change the usual procedure. Any child who is given his milk from a bottle until after he is old enough to take it from a cup clings to the bottle not only because of his long and pleasant association with it ("Oh! but Doctor, he just loves his bottle so") but also because he regards taking milk in any other manner as peculiar, and who can say that he is not already beginning to defend his desires on the grounds of righteousness and morals. If he could express his thoughts he might well say " 'Tain't right and decent to take milk from a cup. I've never heard of such a thing and what will people say if I do it?"

WHAT IS A "SPOILED CHILD"

Some one may think when one reads that a child should be taught to fend for himself that our idea is that he should be treated more or less mechanically. On the contrary, we want every child to have plenty of attention and affection. However, both attention and affection must come to him spontaneously out of his parent's love and wisdom rather than be thrown to him as an appeasement lest he make himself too disagreeable for toleration. Time and thought must be allotted for his training and his pleasure. But when the necessities of life demand that his time must be changed or temporarily curtailed, his lack of understanding or his displeasure must not become the scourge which drives his unwilling parents to give him grudgingly the attention which he demands and needs with disagreeable methods coming to have too great a value in his mind. A spoiled individual of any age is one who too frequently or too exclusively uses disagreeable methods to get whatever it is he may want.

PARENT AND CHILD

Any relationship between human beings that gives lasting satisfaction and grows toward its greatest possible nobility and beauty must rest on mutual helpfulness. Each must give to the other, at the cost of some sacrifice, that which he possesses and the other needs. No one can for long continue making gifts that come from the heart unless one receives in return some recompense, some satisfaction of one's own needs that replenishes the well springs of one's affection and generosity. This return need not be material; indeed, if it is too largely so it will fall short of its greatest value, the enrichment of the giver. On the other hand, the one who takes all the gifts and makes no adequate return suffers an inevitable impoverishment of the spirit which leads to poverty indeed.

Consequently, if the child develops as he should while under the influence of his parents, he must be taught to give as much as possible to his parents in return for their care for him. If no demands are made on him, he gives rise to that question so frequently asked "Why do the most unselfish parents have such selfish children?" At the beginning of his life in the family the child makes sufficient contribution by the joy of his presence. However, this joy is soon diminished if he is not taught to make only reasonable demands for attention. This first contribution is to take over more and more of his own care, at least to the extent of amusing himself for greater and greater parts of the day. Still later he must be encouraged to wait on himself whenever that is possible and to assist his parents by doing any errand within the household that he is capable of doing. Then certain duties, for example drying the dishes and setting the table for meals or cutting the lawn should be his, even though his parent could do them more easily himself, and any complaint he may make only indicates that he has a fair and normal share of that laziness which is a characteristic of all mankind. Parental authority should have such weight that he fully realizes that there is no way of escaping his assigned duties, but the austerity of sheer authority and the drudgery of labor can and should be greatly softened by the pleasure which comes to each member of a team with accomplishment and the fair distribution of praise. Also when all are free after tasks are done there should be a time set aside when all, young and old, play together. Reading aloud or telling stories in which all children delight, playing simple games such as marbles or tiddlywink, taking needed exercises for improvement of the mechanics of the body which are relieved of all tedium and made gay with laughter, especially when Daddy and Mother take an active and undignified part, singing together (never mind the lack of harmony or the neighbors), a quiet time for talk when the child can tell of all the interesting things of his day and have answers to his questions, and then at last to lead a gay procession up the stairs to bed on Daddy's back makes each day a part of the richness of life, living in pleasant memories and making beauty and balance the very warp and woof of the young lives as they grow and expand toward the fulness of their powers, not to mention giving the parents the greatest happiness that comes in this old world.

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ABSTRACT OF DISCUSSION

DR. OSCAR REISS, Los Angeles: At a time like this it seems most fitting that a paper such as this should be presented before this section. The pediatrician can play an important role by teaching parents a way of life for their children that helps to establish stable emotional patterns and clean minds as well as sturdy bodies. More important than ever does the teaching of mental hygiene by the pediatrician loom up as one of the vital tasks for him to undertake. To do this effectively calls for a careful study of the total environment into which each newborn infant inescapably enters. He must know not only about the parents but also about all the other members of the household, as well as the character of the physical surroundings and the economic status. I hope the time is fast disappearing when the children's specialist devotes all his time during the periodic visits of the young infant to his office to an exploration into the various orifices of the body and other gestures of an examination, often unnecessary to an understanding of the nutritional state, for these visits offer a great opportunity of educating mothers, of imparting to them authentic information concerning the best care of their young, and of debunking much of the misinformation supplied over the radio and by kindly but ignorant friends and neighbors. It behooves us to rise to the broader task before us, to prove authoritative in every phase of child care, to play our part in the development of a new generation of young people fit for the democratic way of life.

DR. EDWARD LISS, New York: One gets enlightenment listening to a paper so packed with wisdom, perhaps because the authors come from Oakland, an area in which I presume the population is more sensitive to current mental hygiene practices, probably, than any other part of the country. The authors reflect the education which so many of our colleges, as pioneers, have already accomplished. As one evaluates the percentage of failure in the somatic areas, one wonders if the entire problem in review is whether allergic problems are not so much alone a question of somatic insufficiency or whether they are something beyond just the somatic area. Most discussions are confined either to the somatic or to the psychologic area. Rarely is an attempt made to integrate this needful and very purposeful interrelationship. Parent-child relationships distinctly affect the prognosis of every somatic problem, for how can any individual be the object of so much well intentioned attention and yet feel that certain aspects of his growth are not particularly significant? I think that any chronic somatic problem brings with it definite emotional repercussions, which are as needful of attention as anything that takes place in the laboratory or in the office. One of the perils which the pediatrician has to overcome in this area is that reeducation of the parents is an extremely slow procedure. It is accompanied by a great deal of resistance, and this resistance must be appreciated as being natural and not of necessity stupidity. Human beings build up patterns for living. If these patterns turn out to be unsuccessful, they must be carefully removed only through some adequate substitution, and substitution is a slow procedure. I hope that the Section on Pediatrics will concern itself with the psychic aspects of disease as much as it has with the somatic. If it does, pediatrics is facing an era of function which is beyond anything it has faced up to the present time.

DR. CLIFFORD D. SWEET, Oakland, Calif.: I hope Dr. Liss did not mean that I merely reflect the interest in child welfare in my community, because I have had something to do over the past twenty years in forming it. It is a necessary ideal for any man, particularly a pediatrician, that he attempt to make the community in which he lives a better place for children. We have an active and interested school department in Oakland, with a full time pediatrician in charge of the school health. We have more and better children's dentistry than any other place in the world. One cannot live in such an atmosphere without being affected by it; but one cannot float, one has to work. I agree with Dr. Reiss that one must not lose one's opportunities because Johnny comes in with an earache, to find out how Johnny is living with his parents. It is interesting; it is not always materially rewarding, but it is always tremendously rewarding in results, and one never knows when one starts a child in a given direction how far that child may go. A little girl was tearing up a magazine in my office. I said to her "My child, why do you tear that? You know books are our friends." She came back five years afterward, and her mother told me that from that day forward she had never mutilated a book of any kind and that she had frequently said to others "Don't tear that; books are our friends." If the pediatrician is really going to influence the attitudes of the people in the family, he must deal with the child and his parents on a basis of frankness, of understanding, of neither belittling nor scolding any of them, and of kindly firmness rather than cajolery in the face of necessary and unavoidable discomfort. I look on these recent tongue blades with candy on them as just another means of making it difficult to teach parents how to help their children grow up, while their doctor uses infantile methods even though he talks big.

A TYPE OF CHRONIC PERITONITIS APPARENTLY DUE TO INTESTINAL INFECTION

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The peritoneum itself is very resistant to infection. In this it probably represents a bactericidal ability beyond any other tissue in the body. This bactericidal ability is especially marked with intestinal organisms, such as those of the coliform group. That the peritoneum is constantly assailed by bacteria is suggested by the work of Roberts, Johnson and Bruckner,[1] in which it was shown that in 80 per cent of the instances, and irrespective of intraperitoneal inflammatory reaction, positive cultures were obtained. These differed from the bacteriology of the air and were of intestinal micro-organisms. In noninflammatory conditions a staphylococcus was recovered in 11.2 per cent. Ordinarily these organisms are cared for by the peritoneum, the lymph and vascular systems and the blood. While the ability of the peritoneum to destroy organisms is high, it apparently is not complete in that in 6 per cent of healthy persons on one vein tap positive blood cultures of low grade infestinal organisms were obtained,[2] this observation having been confirmed.[3]

The chronic forms of peritonitis have been classified as chronic simple, primary and secondary malignant, tuberculous, pneumococcic and hydatid. To make a distinction between these and the form about to be described, a brief pathologic presentation of the different types may be offered. The agglutinating process, which terminates in the fine adhesions so often encountered in the abdomen, is undoubtedly a local process in most instances. These are apparently protective processes resulting in membrane-like attachments which separate often at the slightest touch. The adhesion formations due to chronic peritonitis are more generalized than local and a much more organized and a more difficult tissue to handle. In the tuberculous form these fibro-adhesions are marked, the coils of the intestine are mostly freely movable excepting where adhered in localized areas. In the miliary and localized tumor formations, the appearance is characteristic. The

1. Roberts, Kingsley; Johnson, William W., and Bruckner, Helen Sue: The Aseptic Peritoneal Cavity: A Misnomer, Surg., Gynec. & Obst. 57: 752-761 (Dec.) 1933.
2. Bassler, Anthony: Intestinal Toxemia, Biologically Considered, Philadelphia, F. A. Davis Company, 1930.
3. Cameron, G. C.; Rae, C. A., and Murphy, G. N.: Canad. M. A. J. 28: 131-134 (Aug.) 1931, who report 6 per cent of positives in healthy subjects on only beef heart infusion as the medium.

primary and secondary malignant forms are localized affairs of the peritoneum, the noninvolved parts appearing normal.

In pneumococcic peritonitis there is abundant purulent fluid exudate that is characteristic, this contrasting sharply with the tuberculous form. This is further made definite by the generalized redness of the peritoneum without localized variations and, despite the disposition of the pneumococcus to form fibrin, there is little tendency to adhesion formation. Also of assistance toward diagnosis is the large quantity of purulent material that continues to escape from drainage tubes for days. Diffuse spreading gonorrheal peritonitis beyond the pelvis is rare, although a fine fibril coblike mesh may be seen about the liver surface. Usually the process is about the fallopian tubes, always seems to remain local in the pelvis, and there is much doubt that the gonococcus can cause a generalized peritonitis, the same being true with the hydatid form. There are instances of large areas of adhesions of a viscus, mainly the colon, that are protective processes and are not those fundamentally of a general peritonitis. The acute form of peritonitis is not presented, the type described being distinctly a chronic or continued process.

The peritonitis to be described is a very generalized disorder involving almost all of the peritoneal covering of the different organs in the abdomen. There are no distinct adhesions or localized adherent masses, and larger areas of the peritoneum are massed as if cemented together and separation of one organ from another without tearing into the intestine is quite impossible because of the fixity of the adherent areas and a friability of the tissues. Separation of one organ from another is impossible. The suggestion is that by way of some plastic material which covers large areas of peritoneum a generalized gluing together of structure takes place, the peritoneum being dull and thickened looking and of a yellowish pink. Instead of there being the fibrin type of adhesions more or less localized, or the glistening appearance, the peritoneum is thickened, dull and granular in appearance. Such free fluid as is present is very sparse and is viscid in character. On section of the peritoneum proper there is no area of a layer of sharply defined endothelial cells demonstrable. This is lost in a thickened viscid, edematous process with much cytologic evidence of a marked chronic inflammation which involves the peritoneum and the subperitoneal structures. The appearance of the abdomen mostly simulates that seen in chronic inflammation of the omentum but differs again in that there are no spheroidal nodules, fibrous formation or evidence of fat necrosis.

Case 1.—The first instance of this disorder was observed in 1919 in a man of 47. There had been a long standing history of painful abdominal disturbance. The conditions mentioned were seen at operation. The patient died of a cerebral embolism on the eleventh day after operation. No special studies were made nor a postmortem examination performed.

Case 2.—A woman aged 54, seen in 1926, had had an appendectomy thirty-one years before and a cholecystectomy twenty years before. Her illness particularly was of about two years' standing and the main symptoms were continued severe pain in the abdomen, indigestion and constipation. Her general health seemed good in that she looked well nourished. On examination her abdomen was generally tender to pressure, mostly in the umbilical region. The abdomen seemed stiffened to deep pressure, there being no rebound sign. The x-ray examination was not significant beyond there being definite stasis in the small and large intestine. The blood counts averaged 11,500 leukocytes and a polymorphonuclear count of about 82 per cent. The stool was markedly acid and high in anaerobes, with a predominance of Staphylococcus albus. At operation the abdominal appearances were as described. The small intestine was torn into twice in an attempt to identify the structure and to accomplish something operatively. Nothing more was done, the case proceeding with a fecal fistula of the small intestine, which she controlled with a colostomy bag. At the time of the operations, swabs were made of the peritoneum. The conditions found are presented after the next case. She lived twenty-nine months after the operation and was reported to have died of pneumonia, no postmortem examination having been made. What was interesting though was that the pain in her abdomen gradually subsided and about seven months after the operation was distinctly improved. This is of interest in connection with the following case in the improvement of the peritoneum noted between the two operations.

Case 3.—An unmarried woman aged 54 was seen in 1939 whose main complaint was a "tightening" sensation in the chest and inability to breathe deeply on account of pain in the upper part of the abdomen, which she stated had been gradually getting worse for about ten years. She had had a hysterectomy at her thirty-sixth year because of menorrhagia from fibroids and in her forty-seventh year laparotomy in which an intestinal anastomosis with a button was done. The diagnosis then made was mass adhesions in the abdomen and intestinal obstruction. For two years before being seen by me she had been in poor health and unable to work, the main complaint being as mentioned. She seemed well nourished. Her abdomen was very tender and sensitive and seemed to be stiffened inside. No x-ray examination was made. The urine was high in phosphates, the p_H being 5.1, and otherwise normal. The stool was highly acid, soft and gassy. The bacteriology was high in Staphylococcus albus, Streptococcus nonhaemolyticus, Clostridium putrificum and the bacillus of malignant edema. She seemed to be slowly progressing with an intestinal obstruction and after about three weeks of observation was operated on. The interior of the abdomen presented the conditions mentioned in which the stomach and small and large intestine were massed together. In an attempt at separation, the intestine was torn in three places by only a gentle effort. From each of these openings there came a light yellow, gassy fluid. Swabs were taken of the peritoneum which showed mixed bacteria and on bacteriophage and lytic procedures gave a pure culture of staphylococcus. The operation was followed by a large fecal fistula through which foods taken by mouth came through in about five minutes, practically nothing passing by rectum up to the time she died, suggesting that the opening was high in the small intestine. While in the hospital for four months she slowly lost weight and continued to complain of abdominal pain in a gradually lessening way. In an attempt to reestablish a transit through the bowel and the hope of subsequently closing the fistulous tract, she was operated on again. At this time it was noted that a marked change had taken place in the appearance of the peritoneum. It now was much more normal looking. The adhesions present were those of the more common type, although separation of the organs was not any more possible because of their density. An entero-anastomosis was performed. She died ten days afterward, the postmortem examination revealing a suppurative peritonitis, necrosis of the bowel at the anastomosis, dense adhesions throughout the abdomen, and a granular degeneration of the liver and convoluted tubules of the kidneys. The bacteriology of the fluid in the abdomen was not determined because the infection was believed to be due to leaking from the necrosed intestine.

Since the swabs were the most interesting, only the bacteriologic studies of these in cases 2 and 3 will be presented in some detail because all the bacteria mentioned in these observations had at various times been recovered from the stools. In connection with the stools, however, it was notable that the organisms of the B. coli classification were almost absent at all times. The peritoneal swabs were grown aerobically and anaerobically in seventeen different mediums. Isolation attempts were engaged in through subculturing for identification.

In addition, the phagings of the mixed bacteria were studied by lytic tube procedures to note the most persistent of the organisms, this rather closely following the infectivity of most significance with intestinal bacteria. There was not much difference in both of these cases in the lytic studies. During the first four days in both cases the bacteria were mixed. Those identified in the anaerobic tubes were mostly Alcaligenes bookeri, Clostridium saccharolyticum, welchii and filamentosum, Bacteroides dimorphus and nonhemolytic streptococci. At the sixth and seventh days the anaerobic growths were negative, all the organisms having been phaged in the mediums. Some exceptions were noted in the hard medium specimens but these probably were not significant. In the aerobic studies the organisms were more of the coliform types, they being identified as Eberthella douglasi, dispar and pritznitzi and Escherichia coagulans, wesenbergi and coli. These all phaged within three days. In one case a nonhemolytic streptococcus came in on the third day, remaining only about twenty-four hours. Beginning about the fourth day in both cases and persisting for two weeks, when the observations were discontinued, Staphylococcus albus became prominent, and there is reason to believe that this organism was important in an etiologic sense. What was interesting was that Staphylococcus albus was noted only in the aerobic tubes.

CONCLUSIONS

A type of chronic peritonitis was observed that has not been described in an extensive search of the literature.

Apparently the cases are not common and are characterized by continued illness of a most persistent painful type, the absence of constitutional symptoms and the presence of a fair state of health.

The bacteriology of the peritoneal cavity seems to be of the mixed type in which Staphylococcus albus is prominent and this seems to be important in an etiologic way.

The improvement clinically in the second case and the improvement in the appearance of the peritoneum between the operations in the third case suggest that the improvement came about by the fistula, which in each case was large enough to be practically equivalent to an ileostomy. If this constant drainage of the small intestine brought about the benefits, it seems logical to suppose that when this type of chronic peritonitis is encountered at operation, instead of attempting to do various types of operations, it would be wiser to perform an ileostomy at once and perhaps one of the closure types of anastomoses at from six to twelve months afterward.

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Three Varieties of Lice.—The louse attaches its eggs either to hair or to fabric by an insoluble cement. The female lays five or more such eggs daily, and, since the nit hatches in eight days and is full grown in a month, a single female may have thousands of descendants in a few weeks. The provision for the birth of the young louse is unique. One end of the egg has a cap, which is pierced by holes. When ready to emerge, the young louse swallows air, which, when ejected from the bowel, produces enough pressure to force its body out of the egg. There are three varieties of lice parasitic to man: Pediculus capitis or head louse, Pediculus vestimenti or body louse, and Pediculus pubis or crab louse.—Holmes, William H.: Bacillary and Rickettsial Infections, New York, Macmillan Company, 1940.

Clinical Notes, Suggestions and New Instruments

CONTACT DERMATITIS DUE TO NAIL POLISH

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Contact dermatitis due to nail polish probably is more common than the number of reported cases indicates. The 5 cases reported here illustrate the necessity for considering nail polish as a cause of dermatitis on the eyelids, face, neck and arms. Even though the patient has used the polish for years with impunity, it may still be the contact irritant.

Silver and Chiego [1] attempted to sensitize guinea pigs to nail lacquers without success. Five thousand patch tests with nail lacquers and various constituents of the finished product resulted in negative reactions to the finished enamels and some plus-minus to "1 plus reactions" to certain dyes. They suggested that the other ingredients protected the skin from the dyes. Silver and Chiego found the report of only 1 case on nail lacquer dermatitis, but from the random statements in the literature they inferred that nail lacquers are possible causative agents for various types of eruptions. Schwartz in discussing contact dermatitis mentions the fact that many cases of dermatitis due to nail polishes are seen. Schwartz and Tulipan [2] state that dermatitis of the face has been reported from contact with finger nails dressed with nail polish. Rostenberg and Sulzberger [3] and Sulzberger [4] state that patch tests may be made with nail polish at the concentration in the original container.

Sulzberger has reported 2 cases of dermatitis due to nail polish. The first [5] was that of a girl who had an eruption in the axillary fossae and on the neck due to a red dress. Later three attacks of dermatitis on the face and eyelids followed an application of a red nail polish. A patch test with a red lipstick gave a negative reaction and the patient was able to use with impunity nail polish of a different make. In the second case [6] the eruption involved eventually the eyelids, lips, face, neck, chest and arms. After the eruption had undergone involution a patch test with the nail polish resulted in a local reaction and a flare-up of dermatitis in the previously affected areas.

Belote [7] stated that it is surprising how many eruptions around the eyes and nose are actually due to nail polish and nail polish remover. Feiler [8] reported a case of dermatitis of the face of a patient whose skin was sensitive to Almay perfume, Style-set lipstick and Platinum nail polish.

REPORT OF CASES

CASE 1.—L. V. S., a white girl aged 24, was seen for a dermatitis of five months' duration which had appeared first on the face and neck and later in the cubital spaces. Two months after the original eruption some irritation appeared on the dorsum of the fingers over the terminal phalanx just proximal to the nail folds. The eruption was essentially the same in all areas and consisted of an ill defined erythema with some evidence of mild vesiculation and a slight, loosely adherent scaling. The dermatitis on the finger tips was very suggestive that nail polish was acting as an irritant, in spite of the fact that eruption on the other parts had appeared two months previously. She gave a positive reaction to a patch test of a certain nail polish which she had been using but a negative

1. Silver, Henry, and Chiego, Bernard: Nails and Nail Changes: Investigation of Nail Lacquers and Their Components, J. Invest. Dermat. **2**: 361 (Dec.) 1939.
2. Schwartz, Louis, and Tulipan, Louis: A Text-Book of Occupational Diseases of the Skin, Philadelphia, Lea & Febiger, 1939, p. 238.
3. Rostenberg, Adolph, Jr., and Sulzberger, M. B.: A List of Substances for Patch Testing and Concentrations to Be Employed, J. Invest. Dermat. **2**: 93 (June) 1939.
4. Sulzberger, M. B.: Dermatologic Allergy, Baltimore, C. C. Thomas, Publisher, 1940, p. 437.
5. Sulzberger, M. B.: Hypersensitivity to Nail Polish, Arch. Dermat. & Syph. **36**: 460 (Aug.) 1937.
6. Sulzberger, M. B.: Eczema Venenatum from Nail Polish, Arch. Dermat. & Syph. **42**: 218 (July) 1940.
7. Belote, G. H., in discussion on Eczema Seborrheicum with Unusual Persistent Localization, Arch. Dermat. & Syph. **41**: 1121 (June) 1940.
8. Feiler, H. B.: Eczema Venenatum Due to Lipstick and Nail Polish, Arch. Dermat. & Syph. **42**: 224 (July) 1940.

reaction to nail polish remover. Control tests on two normal persons gave negative results. The patient discontinued the use of this nail polish and with mild local therapy the condition practically disappeared in about two weeks. In response to an inquiry the makers of the offending polish wrote that their various shades of nail enamels contained in all about eighty possible ingredients. Through Dr. Louis Schwartz of the National Institute of Health we obtained some of these ingredients and made patch tests with "plasticizers," castor oil, camphor, dibutylphthalate and also with clear lacquer, titanium dioxide and several of the dyes, including oil orange F, D and C number 2, deep maroon c24004, tropical red D and C number 8 and barium lake red. There was a slightly positive reaction to deep maroon c24004 and to the camphor plasticizer and a strongly positive (vesiculation) reaction to clear lacquer. The other tests gave negative results.

CASE 2.—A white girl aged 19 was first seen on June 3, 1940, for an eruption of two months' duration. The eruption was on the lobes of the ears, on the chin, on the alae of the nose, on and around the eyelids, on the anterior axillary folds and on the extensor surfaces of the thumbs just proximal to the nail borders. It consisted of ill defined areas of acute and subacute dermatitis whose essential characteristics were moderate erythema, slight vesiculation, exudation or weeping and the presence of varying amounts of crusts and scales. The patient complained of marked pruritus. A definite etiologic factor was not determined; nevertheless the dermatitis responded to local external therapy. One month later the patient returned because of an exacerbation of the eruption in the majority of the areas formerly affected. Patch tests were made with several types of perfumes, a nail polish and a nail polish remover. All gave negative results except the nail polish. This caused a "2 plus" reaction which was moderately active ten days later. The presence of the severe dermatitis on the lobes of the ears was partly explained by the fact that the patient wore ear rings, and in the process of putting them on the nail surfaces came in contact with this part of the ear.

Patch tests were performed with "plasticizers," castor oil, camphor, dibutylphthalate, clear lacquer, titanium dioxide and a second nail polish, with negative reactions to all but the finished nail polish. The tests demonstrate that the ingredients of the foundation of the nail polish tested did not protect the patient to the finished polish or the dye.

CASE 3.—M. C., a white woman aged 22, was referred to us for diagnosis and treatment of a moderately pruritic eruption of one month's duration on the left palm and about the eyes. The eruption began on the left palm, and a few days later an area around the eyes became involved. An ointment and a lotion prescribed by her family physician apparently aggravated the condition.

The left palm presented a well defined 2.5 by 2 cm. oval patch consisting of grouped and confluent erythematous deep seated vesicles about 2 mm. in diameter. In some areas there was slight scaling and crusting. On the eyelids, extending slightly above the eyebrows and on the infra-orbital region, there was an ill defined, erythematous, edematous, slightly scaly eruption. Examination of the feet and toes for evidence of fungous infection revealed only a slight fissuring in the interphalangeal web of the fourth and fifth toes of the right foot. The dermatitis of the eyelids had features strongly suggestive of an eruption of contact origin. Therefore patch tests were performed with the ointment and lotion previously used and with another brand of nail polish and remover. There was a very marked vesicular reaction to the ointment, the nail polish and the polish remover. Two control patients gave a strongly positive reaction to the ointment, thus indicating if not proving that it was a primary irritant. The eruption of the eyelids showed marked improvement following the application of a mild lotion and the removal of all irritants. Later patch tests were performed with three other brands of nail polish, clear lacquer, dibutylphthalate, castor oil, camphor and titanium dioxide. The results were a mild positive reaction to dibutylphthalate and a plus-minus reaction to clear lacquer. The patient refused further patch testing. It is of interest that the patient had used the nail polish and polish remover for a number of years with impunity and only after an ointment had caused an irritation about the eyes did she apparently become sensitive to the nail polish and polish remover.

CASE 4.[9]—A white woman aged 29, first seen on March 7, 1940, presented an eruption on the neck and face. The lesion was of three weeks' duration and had the characteristics of a dermatitis of external contact origin. The first site involved was the anterior part of the left side of the neck. The dermatitis then spread to the orbital region. Patch tests with various materials suggested by the history failed to determine the etiologic factor. Subsequently the eruption extended to her shoulder. When the patient was seen on July 1 she had two areas of dermatitis on her legs corresponding to the areas of her stocking to which she had applied a nail polish two days previously for "runs." Patch tests were made with a colorless nail polish and three other brands of tinted nail polish. All four gave positive results. There was no reaction to a patch test with titanium dioxide and the three plasticizers, but there was a "4 plus" reaction to the clear lacquer. Control patch tests on a normal person were negative.

CASE 5.[10]—A white woman aged 30 on May 13, 1940, noticed a swelling, redness and itching on the upper eyelids and on the lower lip below the vermilion border. After several periods of quiescence and exacerbations the patient stopped the use of all cosmetics. When the dermatitis had disappeared the use of cosmetics was resumed by applying a new preparation every two days. Twelve hours after a nail polish was painted on the nails the eruption reappeared on the eyelids and the lower lip. Later when another brand of nail polish was applied the redness and pruritus recurred. The fingers were not affected. Patch tests with the three plasticizers, titanium dioxide and clear lacquer gave negative results. This indicated that the dye was the sensitizing agent.

COMMENT

Considering the widespread use of nail polish and the few reports of dermatitis due to this cosmetic, one would infer that nail polish is a relatively unimportant etiologic factor of contact dermatitis. It is recognized that any of its ingredients may act as a sensitizer, but our experience suggests that the more important factors are the clear lacquer and the dyes. Three patients gave positive reactions to the clear lacquer. This is cellulose nitrate dissolved in a mixture of volatile solvents. The volatile solvents are usually primary irritants[11] because they are fat solvents capable of dissolving the sebaceous material, or fat, of the skin. However, when applied, covered with cellophane or uncovered, five control patch tests with the lacquer gave negative results. The dye in many of our cases was probably the responsible agent because the other ingredients usually gave negative reactions. The clear lacquer may have the property of synergic or potentiating antigenicity;[12] briefly, this means that when the clear lacquer is mixed with another antigen it enhances or changes the antigenicity of the second substance (the dye). Case 3 may be another example of this phenomenon. The dermatitis, which was due to another cause, apparently initiated sensitization to nail polish and remover. It is well recognized that persons with fungous, bacterial, atopic or contact dermatitis are prone to become sensitized to agents which they previously used with impunity. The second and fifth cases demonstrate that the ingredients in the foundation do not necessarily protect the patient from the finished product containing a dye even though negative reactions are obtained to the ingredients of the foundation of the nail polish.[13]

SUMMARY

1. Nail polish probably is more frequently the cause of contact dermatitis than may be implied from the few previously reported cases.

9. Dr. Maurice Sullivan gave the authors permission to report this case.

10. Drs. Maurice Sullivan and Robert Arthur gave the authors permission to report this case.

11. Schwartz, Louis: Personal communication to the authors.

12. Burky, Early, in discussion on Dermatitis of the Hands, Arch. Dermat. & Syph. 39: 893 (May) 1939.

13. Since this article was accepted for publication we have seen 4 additional patients with dermatitis on the face due to nail polish. All gave positive patch tests to a finger nail polish in contrast to those reported by Lester Hollander (Nail Laequer Dermatitis, J. A. M. A. 115: 1714 [Nov. 16] 1940).

2. The dyes and/or the foundation of a nail polish may be the sensitizing agent.

3. A patient sensitized to one brand of nail polish at times may use with impunity another brand of polish or the same brand containing a different dye.

5. The eruptions due to nail polish usually appear first on the eyelids and in the cubital spaces. The surface of the finger near the nail may not show any dermatitis. This could be due to the protective quality of their thick epidermal coverings.

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Special Article

GLANDULAR PHYSIOLOGY AND THERAPY

GONADOTROPINS OF THE ANTERIOR LOBE OF THE PITUITARY AND OF CHORIONIC TISSUE

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The concept of gonadotropic action of the anterior lobe of the pituitary gland arose from the experiments of Philip E. Smith in 1926, in which the treatment of immature rodents with implants of fresh anterior lobe produced follicular growth and the formation of corpora lutea. Similar effects were found at the same time in immature mice by Aschheim and Zondek, but Smith demonstrated that atrophy of the gonads follows hypophysectomy and that it may be prevented or the gonads repaired by treatment with fresh anterior pituitary implants.

Since this pioneer work, an amazing mass of literature concerning this subject has accumulated. It is beyond the scope of this chapter to consider all the work which has been reported. For such a comprehensive review the reader is referred to Van Dyke (1939).[1] In the present article attention will be directed to those observations which appear to be most firmly established and of greatest interest to one seeking to understand the action of the gonadotropic substances.

CLASSIFICATION

Two large groups of gonadotropins, differing in their qualitative physiologic action, are now known. The first consists of those obtained directly from the pituitary gland and, in addition, those probably of pituitary origin extracted from the blood and urine of normal men and women and of women who have undergone menopause (artificial or natural).

The second major group of gonadotropins, the chorionic, derives its name from the fact that these substances are found in body fluids and tissues in the presence of living chorionic tissue, i. e., during normal pregnancy in women and in mares or when pathologic chorionic tissue is present. It is an accepted opinion that these gonadotropins originate from chorionic cells and are not anterior pituitary gonadotropins.

ANTERIOR PITUITARY GONADOTROPINS

Several gonadotropins from the anterior lobe of the pituitary have been postulated, but there is no general agreement as to their identity or their action. The greatest unanimity of opinion probably exists with respect to the so-called follicle-stimulating and luteinizing hormones, first postulated by Zondek, but the evidence as to the separate identity of these is not completely convincing to all investigators.

A great deal of the disagreement concerning the occurrence of these two gonadotropins as separate entities is due to the fact that at present proof of the identity of either substance depends on biologic differentiation. This differentiation is, in turn complicated by lack of distinct end points. In many reports the interpretation of qualitative results is further complicated by the fact that intact animals were used, thus introducing as a factor the variable and unpredictable participation of the animal's own pituitary. Only the hypophysectomized rat or mouse affords standard test conditions.

The present status of the so-called follicle-stimulating and luteinizing hormones may be briefly summarized as follows:

A number of reactions of the ovaries and of the testes have been ascribed to each of these hormones. In the hypophysectomized female rat the purified follicle-stimulating extract causes growth and development of numerous follicles, associated with increase in ovarian weight. According to proponents of the dual hormone theory, it does not, if completely separated from the luteinizing factor, produce any lutein changes.

A secondary effect of the follicle-stimulating factor, presumably due to secretion of estrogen by the developing follicles, is the development of the secondary genitalia. However, Greep, Van Dyke and Chow (1940) [2] have recently described what is claimed to be a very pure preparation of the follicle-stimulating substance and have stated that although it stimulates follicular growth, it does not have any estrogenic effect, as indicated by lack of uterine and vaginal change.

When administered to the hypophysectomized male rat, the follicle-stimulating extract produces a reaction analogous to that in the female. The epithelium of the seminiferous tubules is maintained or repaired, and sperm formation proceeds at least to the stage at which secondary spermatocytes appear. There is no effect on the testicular interstitial tissue, which remains atrophic, as indicated by its histologic appearance as well as by the atrophic state of the accessory sex glands.

The identity of the luteinizing hormone is particularly difficult to establish when its effects on the ovary are studied. According to proponents of the dual hormone theory, the luteinizing factor by itself has no positive effect on the ovary of the hypophysectomized rat. Follicles ripened to a certain degree are apparently necessary for the production of lutein changes by the luteinizing hormone. Such changes may be produced

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1. Van Dyke, H. B.: The Physiology and Pharmacology of the Pituitary Body, Chicago, University of Chicago Press, 1936, vol. 1; 1939, vol. 2.

2. Greep, R. O.; Van Dyke, H. B., and Chow, B. F.: Separation in Nearly Pure Form of Luteinizing (Interstitial-Cell-Stimulating) and Follicle-Stimulating (Gametogenic) Hormones of the Pituitary Gland, J. Biol. Chem. 133: 289 (March) 1940. Shedlovsky, T.; Rothen, A.; Greep, R. O.; Van Dyke, H. B., and Chow, B. F.: The Isolation in Pure Form of the Interstitial Cell-Stimulating (Luteinizing) Hormone of the Anterior Lobe of the Pituitary Gland, Science 92: 178 (Aug.) 1940.

by administering an extract containing the latter factor to animals simultaneously with, or following, an extract containing the follicle-stimulating factor, in which case luteinization and sometimes ovulation result. The combination of the luteinizing and follicle-stimulating extracts also results in the "augmentation" phenomenon, the weight of the ovary increasing much beyond the sum of the increases produced by the two substances separately. It is stated [3] that the luteinizing hormone stimulates the interstitial ovarian tissue.[4] Another action of this hormone is that of causing rapid involution of existing corpora lutea with concomitant decrease in ovarian weight.[5] The absence of this hormone may be the reason for the prolonged survival of preformed corpora in the hypophysectomized rat.

In the hypophysectomized male rat the luteinizing extract is reported to have a more distinct effect. Whereas in this form the follicle-stimulating substance stimulates only the tubular elements of the testis, the luteinizing factor produces growth and functional activity of the interstitial cells, as indicated by the histologic picture of the testis, as well as by the growth and development of the accessory sex glands, presumably as a result of secretion of androgen. If male rats are treated with a combination of follicle-stimulating and luteinizing substances, a synergism between the activities of these substances is noted, the responses being greater than with either fraction alone.[6]

Evidence has been offered enabling several authors to question the identity of two distinct pituitary gonadotropins or of a separate luteinizing factor. This evidence, beginning with the findings of Maxwell (1934) [7] is based on the fact that by manipulating the rate at which the administered gonadotropin reaches the ovary the reactions ascribed to the luteinizing factor by its proponents may be abolished or caused to appear. Thus Maxwell and others have demonstrated that by properly dividing the doses of unfractionated pituitary extract to be administered the incidence of lutein changes may be greatly diminished. Also, it has been adequately shown that addition of zinc sulfate ($ZnSO_4$) or copper sulfate ($CuSO_4$) or a variety of other nonspecific substances to the unfractionated extract causes at least partial abolition of the luteinizing properties. All these treatments tending to decrease the rate of entrance of the injected gonadotropin into the blood stream also increase the weight response of the ovary. Furthermore, Saunders and Cole [8] have reported that zinc sulfate and egg albumin, if combined with the follicle-stimulating extract, are more effective in producing augmentation than is the luteinizing substance. However, it should be pointed out that the follicle-stimulating substance (and/or synergist [9]) which was used by these authors, of itself, produced corpora lutea in a great majority of the treated animals. It is not surprising, therefore, that addition of more luteinizing substance failed to produce augmentation.

The increased weight response and the decrease in the incidence of luteinization which result when the rate of entrance of the gonadotropin into the blood stream is decreased by the addition of nonspecific substances have been demonstrated only in the female rat. In these instances nonspecific substances have been substituted for luteinizing substance. However, the luteinizing fraction alone will cause interstitial activation in the male, and no one has yet demonstrated that nonspecific substances alone are able to simulate the effects of luteinizing substance on the interstitial cells and accessory sex glands of the hypophysectomized male rat.

Other evidence cited in support of the two hormone theory is that produced by Du Shane and his associates.[10] These investigators, using parabiotically united rats, castrated one of the parabionts (either male or female) and hypophysectomized the other (female). The ovaries of the hypophysectomized partner showed a high degree of follicular stimulation over a long period. They contained large follicles, many of them cystic, but no lutein changes were present. This correlates well with the concept that after castration the pituitary secretes large amounts of follicle-stimulating hormone. If there is only one pituitary gonadotropic hormone, it is not easily understandable why such ovaries, apparently exposed to effective gonadotropic stimulation over long periods, do not show lutein changes.

On the other hand, experiments have been performed that were identical except that hypophysectomized male instead of female rats were exposed to the gonadotropin from castrate parabiotic partners.[11] In these experiments the testes showed maintenance of interstitial cells and of accessory glands, a reaction presumably evoked by the luteinizing rather than by the follicle-stimulating hormone. Similarly Greep [12] simultaneously produced parabiosis of a hypophysectomized immature male rat, on one hand, and of a hypophysectomized female rat, on the other, with a third rat, a castrate. Thus a pair of testes and a pair of ovaries were simultaneously subjected to the same gonadotropin in identical dosage. Development of all the testicular elements was noted, while the ovaries showed only follicular stimulation.

The findings of Rowlands [13] are also interpreted to indicate two gonadotropic hormones. He treated rabbits chronically with preparations rich in luteinizing potency until antigonadotropic substances were demonstrable in the serums. These serums when injected together with unfractionated extracts containing both the follicle-stimulating and the luteinizing factor were able to neutralize selectively the luteinizing factor, leaving the

3. (a) Evans, H. M.; Simpson, M. E., and Pencharz, R. I.: An Anterior Pituitary Gonadotropic Fraction (Interstitial-Cell-Stimulating) Specifically Stimulating the Interstitial Tissue of Testis and Ovary, Cold Spring Harbor Symposia on Quantitative Biology, Cold Spring Harbor, L. I., New York, The Biological Laboratory, 1937, vol. 5. (b) Fevold, H. L.: Extraction and Standardization of Pituitary Follicle-Stimulating and Luteinizing Hormones, Endocrinology **24**: 435 (April) 1939.

4. Evans, Simpson and Pencharz have claimed the separation of an additional gonadotropin which stimulates only the interstitial cells of the ovary and testis. This material, named interstitial cell-stimulating hormone, appears to be the same as the previously postulated luteinizing factor. Evans, H. M.; Simpson, M. E.; Tolkadorf, Sybylle, and Jensen, H.: Biological Studies of the Gonadotropic Principles in Sheep Pituitary Substance, Endocrinology **25**: 529 (Oct.) 1939. Fevold.[3b]

5. Bunde, C. A., and Greep, R. O.: Suppression of Persisting Corpora Lutea in Hypophysectomized Rats, Proc. Soc. Exper. Biol. & Med. **35**: 235 (Nov.) 1936.

6. Greep, R. O.: Pituitary Regulation of the Male Gonad, in Cold Spring Harbor Symposia on Quantitative Biology, Cold Spring Harbor, L. I., New York, The Biological Laboratory, 1937, vol. 5.

7. Maxwell, L. C.: The Quantitative and Qualitative Ovarian Response to Distributed Dosage with Gonadotropic Extracts, Am. J. Physiol. **110**: 458 (Dec.) 1934.

8. Saunders, F. J., and Cole, H. H.: On the Reliability of Present Methods for Characterizing Two Gonadotropic Hormones, Follicle-Stimulator and Luteinizer, Endocrinology **23**: 302 (Sept.) 1938.

9. The designation of the "synergist" as a separate and distinct gonadotropic fraction no longer seems justified since Evans has admitted that the pituitary fraction designated by this term is the same as the follicle-stimulating fraction.

10. Du Shane, G. P.; Levine, W. T.; Pfeiffer, C. A., and Witschi, E.: Experimental "Constant Oestrus" and the Notion of Antigonadotropic Hormones, Proc. Soc. Exper. Biol. & Med. **38**: 339 (Dec.) 1935.

11. Cutuly, Eugene; McCullagh, D. R., and Cutuly, Elizabeth: The Type and Degree of Gonadal Stimulation Induced in Hypophysectomized Male Rats Parabiotically Joined with Castrated, Cryptorchid, and Normal Partners, Endocrinology **21**: 241 (March) 1937. Cutuly, Eugene and Cutuly, Elizabeth C.: Inhibition of Gonadotropic Activity by Sex Hormones in Parabiotic Rats, ibid. **23**: 560 (May) 1938.

12. Greep, R. O.: Pituitary Function in Parabiotic Triplet Rats, Proc. Soc. Exper. Biol. & Med. **44**: 214 (May) 1940.

13. Rowlands, I. W.: Selective Neutralization of the Luteinizing Activity of Gonadotropic Extracts of Pituitary by Anti-Sera, Proc. Roy. Soc., London, s. B **126**: 76 (Sept. 23) 1938.

follicle-stimulating one free to act. That this was not a matter of alteration of the rate of absorption of a gonadotropin by nonspecific substances was proved by the fact that serums from control animals did not possess this selective neutralizing ability. Furthermore, the selective inactivation was observed after injection of serum and gonadotropin at different sites, so that mixing, if any, presumably occurred after absorption.

A great deal of chemical work has been done on the separation of the two hormones (Fevold;[14] Evans;[15] Wallen-Lawrence;[16] Van Dyke[17]). Many of the preparations have been considerably purified, and data to indicate chemical homogeneity have been reported for at least one preparation.[2] Selective inactivation by enzymatic action has been employed to demonstrate the presence of two separate gonadotropic substances. However, in every case the demonstration of the distinctness of the hormone fractions has depended on one or more of the biologic tests described in foregoing paragraphs. Until the qualitative accuracy of the biologic end points have been more adequately demonstrated and until the luteinizing hormone-like effects of nonspecific substances are completely ruled out, it is not profitable, in relation to this question, to discuss the chemical differences which have been reported for the two fractions.

It has not been adequately shown that the best preparations of the follicle-stimulating and the luteinizing factor so far reported, if injected in high doses or over long periods, will not each produce the effects ascribed to the other. The difficulty of a distinct chemical separation of this type of substance makes understandable the contamination which occurs in even the best preparations made to date. It must be recognized, however, that the final solution of this problem will be achieved only when one or more active substances have been isolated in chemically pure form and when it is demonstrated whether one or more of the pure substances are necessary to account for all the physiologic responses. It may be hoped that the chemically pure luteinizing hormone announced by Shedlovsky and his co-workers [2] will soon lead to such a demonstration.

In summary, the validity of the concept of two distinct pituitary gonadotropins depends at present chiefly on proof of the occurrence of the so-called luteinizing hormone. Proof based on the reactions of the rodent ovary is inadequate because similar reactions can be produced by manipulation of dosage and by use of nonspecific substances. The reaction of the testis affords better indications of the occurrence of a gonadotropic principle distinct from the follicle-stimulating or gametokinetic hormone, but even in this regard one encounters valid conflicting evidence. Therefore, a final answer to this important and intriguing question must await further clarifying work.

14. Fevold, H. L.: The Gonadotropic Hormones, in Cold Spring Harbor Symposia on Quantitative Biology, Cold Spring Harbor, L. I., New York, The Biological Laboratory, 1937, vol. 5. Fevold, H. L.; Lee, M.; Hisaw, F. L., and Cohn, E. J.: Studies in the Physical Chemistry of the Anterior Pituitary Hormones, Endocrinology **20**: 999 (June) 1940. Fevold [3]

15. Jensen, H.; Simpson, Miriam E.; Tolksdorf, Sybylle, and Evans, H. M.: Chemical Fractionation of the Gonadotropic Factors Present in Sheep Pituitary, Endocrinology **25**: 57 (July) 1939. Evans, H. M.; Koerp, K.; Simpson, M. E.; Pencharz, R. I., and Wonder, D. H.: On the Separation of the Interstitial Cell-Stimulating, Luteinizing and Follicle-Stimulating Fractions of the Anterior Pituitary Gonadotropic Complex, Univ. California Publ. Anat. **1**: 255, 1936.

16. Wallen-Lawrence, Zonja: Proof of the Existence of a Follicle-Stimulating and a Luteinizing Hormone in the Anterior Lobe of the Pituitary Body, J. Pharmacol. & Exper. Therap. **51**: 263 (July) 1934.

17. Chow, B. F.; Greep, R. O., and Van Dyke, H. B.: The Effects of Digestion by Proteolytic Enzymes on the Gonadotrophic and Thyrotrophic Potency of Anterior Pituitary Extract, J. Endocrinol. **1**: 440 (Dec.) 1939. Greep and others.[2]

URINARY GONADOTROPINS

Considerable quantities of a gonadotropin are present in the blood and urine of ovariectomized (Fluhman) and postmenopausal (Zondek) women. The work of Hamburger [18] demonstrated this substance to be qualitatively different from the chorionic gonadotropin excreted by pregnant women. Experiments performed with extracts of relatively low potency led Smith and Engle, and Smith, Engle and Tyndale to consider this material as containing a follicle-stimulating or gametokinetic factor. More recently Tyndale, Levin and Smith [19] studied the effects of more potent and relatively nontoxic extracts of this gonadotropin. Normal and hypophysectomized immature rats were used. In the latter the extracts produced only follicular stimulation over a wide dose range. However, when larger doses, eight to ten times the minimal stimulating dose, were administered, luteinization was observed in all the animals. This material, like the pituitary follicle-stimulating substance used by others, produces luteinization if enough of it is administered.

The results obtained when the same material was administered to intact immature rats afford an interesting comparison. Throughout the dose range corpora lutea were formed in the ovaries of some but not all of the test animals. The proportion of animals showing corpora increased with increased dose until, at precisely that dose which produced luteinization in the hypophysectomized animals, all the normal animals showed corpora in their ovaries. This indicates the role which the animal's own pituitary (even before sexual maturity) may play in the gonadotropic-gonadal relationship and the care which consequently must be exercised in the interpretation of qualitative results obtained by the use of intact animals.

That women with normal ovarian function excrete small amounts of a gonadotropin for a short time during the midinterval has been shown.[20] More recently Werner,[21] using the sensitive mouse uterus assay method,[22] has been able to show that this gonadotropin is excreted in a demonstrable amount throughout the menstrual cycle and that the amount is quite constant except for a sudden transient increase during the midinterval. This transient rise, probably related to the ovulatory process, is responsible for the occasional period of excretion noted by the earlier investigators, who used less sensitive assay methods and possibly less quantitative concentration procedures. Werner, in certain of his studies, also determined the excretion of pregnandiol and found that this substance, an indicator of progesterone secretion by the corpus luteum, frequently appears in the urine within two to five days after the "ovulatory" increase in gonadotropin excretion.

18. Hamburger, Christian: Studies on Gonadotropic Hormones from the Hypophysis and Chorionic Tissue, with Special Reference to Their Differences, Acta path. et microbiol. Scandinav., 1933, supp. 17.

19. Tyndale, H. H.; Levin, Louis, and Smith, P. E.: Responses of Normal and Hypophysectomized Immature Rats to Menopause Urine Injections, Am. J. Physiol. **124**: 174 (Oct.) 1938.

20. Kurzrok, Raphael; Kirkman, Irene J., and Creelman, Margaret: Studies Relating to the Time of Human Ovulation, Am. J. Obst. & Gynec. **38**: 319 (Sept.) 1934. Frank, R. T., and Salmon, U. J.: Gonadotropic Blood and Urine Cycles in Normal Menstruating Women, Proc. Soc. Exper. Biol. & Med. **32**: 1237 (May) 1935. Smith, G. V., and Smith, O. W.: The Urinary Excretion of Estrogenic and Gonadotropic Hormones During Menstrual Cycles, the Period of Conception and Early Pregnancy, New England J. Med. **215**: 908 (Nov. 12) 1936. D'Amour, F. E.; Funk, Dorothy, and Liverman, Helen: Daily Gonadotropic Hormone Tests During Fifty Complete Menstrual Cycles, Am. J. Obst. & Gynec. **37**: 940 (June) 1939.

21. Werner, S. C.: A Quantitative Study of the Urinary Excretion of Hypophysial Gonadotropin, Estrogen and Androgen of Normal Women, J. Clin. Investigation, to be published.

22. Levin, Louis, and Tyndale, H. H.: The Quantitative Assay of "Follicle-Stimulating" Substances, Endocrinology **21**: 619 (Sept.) 1937.

Although the exact nature of the gonadotropin excreted by normal women is not yet established, a limited study by D'Amour [23] indicates that this substance is very similar to that excreted following the menopause.

Normal men excrete a gonadotropin in somewhat larger amounts than do normal women. No careful day by day studies have been made, but the available data afford no indication of cyclic variation in this excretion.

The qualitative nature of the urinary gonadotropin of the normal male has been investigated recently in this laboratory.[24] Over a wide dose range this material produced only follicular stimulation in immature hypophysectomized female rats. Higher doses caused lutein changes. It therefore appears that the urinary gonadotropin of normal men is very similar to or identical with that excreted by ovariectomized or postmenopausal women.

It is of interest that although postclimacteric women excrete increased amounts of gonadotropin with fair regularity, several investigators have been unable to find increased excretion of gonadotropin in aged men with varying degrees of genital involution.

GONADOTROPIN OF HUMAN PREGNANCY

The gonadotropin of human pregnancy was discovered by Aschheim and Zondek. It appears in the blood and urine soon after the implantation of the ovum,[25] and affords the basis for the Aschheim-Zondek and Friedman pregnancy tests. It has been reported to appear before the first missed menstrual period. The concentration of the gonadotropin in the blood and urine increases rapidly during the first part of pregnancy, reaching a high titer fifty to sixty days after the last menstrual period; it then declines rapidly to relatively low levels, which are maintained until a few days after parturition, when the substance disappears from the blood and urine. The same gonadotropin has been demonstrated in large amounts in the placenta, the concentration being roughly parallel to that in the blood and urine.

A gonadotropin has also been found during brief periods in the urine of pregnant rhesus monkeys and chimpanzees. A similar but not identical chorionic gonadotropin, to be discussed in a later section of this review, appears in the blood but not the urine of pregnant mares. Investigation of the tissues and body fluids of a rather extensive variety of other mammals has not as yet demonstrated gonadotropic activity.

The human chorionic gonadotropin differs qualitatively from other known gonadotropins. It is not anterior pituitary–like, and there is no longer any reason for the use of the designation "anterior pituitary–like," which was applied to this gonadotropin before its nature was well known. Neither is the designation "prolan A" as defined by Zondek any longer applicable to any fraction of this substance, since it is not under any condition a follicle-stimulating gonadotropin.

In the immature female rodent (rat or mouse) the growth of follicles (reaction 1), the appearance of hemorrhagic follicles (reaction 2, more constant in the mouse) and the formation of corpora lutea (reaction 3) follow exactly the description recorded by Aschheim and Zondek. Examination of the effects of this gonadotropin in the hypophysectomized rat prove that these reactions, though valid for the intact animal, are partially due to the participation of the animal's own pituitary. The age of the animal and the length of the period of regression following removal of the pituitary both affect the quality of the response.

In immature female rats treated immediately after hypophysectomy Leonard and Smith [26] found that corpora lutea could be formed. This occurs only if maturing follicles are present in the ovary at the time of hypophysectomy and if treatment is instituted immediately. In either case the interfollicular (interstitial) cells as well as the cells of the theca are caused to hypertrophy, and atretic follicles are converted into luteoid bodies. Estrogen is secreted (by the hypertrophied interstitial and thecal cells), as indicated by the vaginal cornification and estrus. In no instance has human chorionic gonadotropin been observed to cause follicular growth in hypophysectomized animals, whether adult or immature.

In general, all other animals below primates which have been studied react as does the rat. Details of the species differences can be found elsewhere.[25] In the presence of a functional hypophysis, treatment with this chorionic gonadotropin results in stimulation of follicles and luteinization, frequently with ovulation. If the hypophysis is removed, estrus is induced by the secretion of the interfollicular, interstitial or thecal cells without follicular growth.

The Algerian baboon is reported to respond as do the lower animals (Courrier). The common laboratory rhesus monkey (Macacus mulatta), however, is quite different. Even in intact monkeys (rhesus) the human chorionic gonadotropin causes neither follicular growth, nor ovulation nor luteinization. If normal animals in the first part of the menstrual cycle are given adequate doses of an extract containing this substance, the estrogenically induced swelling and color of the sex skin disappears and the bleeding due to estrogen withdrawal follows. In immature females no follicular stimulation occurs, as judged by either the sex skin response or by ovarian structural changes. Small follicles are quickly forced into atresia with the formation of scar tissue, similar to corpora albicantia. Corpora lutea may be formed in the intact animal if a follicle stimulator is added to the chorionic gonadotropin.

Geist reported on structural changes in human ovaries after treatment with human chorionic gonadotropin and stated that "apparently there is no stimulation of the follicle, rather an arrest of follicular development." Hamblen,[27] in several series, observed neither follicular growth, nor ovulation nor production of functional corpora lutea. That the structural changes of the human ovary after this treatment are mainly those of arrest or are degenerative in nature does not necessarily indicate that this substance is therapeutically without value in women.

The therapeutic value of this substance in gynecologic practice will be discussed in another chapter. It is pertinent to state here, however, that morphologic studies on human ovaries conform in general to the observations on the monkey.

23. D'Amour, F. E.: A Qualitative Study of Normal Gonadotropin, Am. J. Physiol. 127: 649 (Nov.) 1939.
24. Leathem, J. H., and Levin, Louis: The Gonadotropic Action of Normal Male Urine Extract on the Ovaries of Normal and Hypophysectomized Immature Rats and of Immature Mice, to be published.
25. Engle, E. T.: Gonadotropic Substances of Blood, Urine and Other Body Fluids, in Allen, Edgar; Danforth, C. H., and Doisy, E. A.: Sex and Internal Secretions, Baltimore, Williams & Wilkins Company, 1939.
26. Leonard, S. L., and Smith, P. E.: Responses of the Reproductive System of Hypophysectomized Rats to Injections of Pregnancy-Urine Extracts: II. The Female, Anat. Rec. 58: 175 (Jan. 25) 1934.
27. Hamblen, E. C.: Endocrine Gynecology, Springfield, Ill., Charles C. Thomas, Publisher, 1939.

As has been pointed out in the preceding paragraphs, human chorionic gonadotropin does not stimulate the gametogenic elements of the mammalian ovary but does produce some of the reactions ascribed to the luteinizing hormone of the pituitary gland. In the hypophysectomized male rat the analogy is not quite so clear. In such animals, as well as in intact immature male rats, the first and constant response to the gonadotropin of human pregnancy is a hypertrophy of the interstitial cell mass of the testis, as shown by an adequate series of hypophysectomized adult male rats studied by Smith and Leonard.[28] Results of other workers are in good general agreement.

If the treatment of mature animals is instituted immediately after hypophysectomy, spermatogenesis as well as the size of the accessory glands can be maintained. The characteristic maintenance of the interstitial cells and the production of androgen necessary for the accessory glands are adequate. However, it has been demonstrated that androgen alone will maintain spermatogenesis in the hypophysectomized rat.[29] Nelson [30] has stated that spermatogenesis in this animal can be maintained with androgen alone if treatment is begun within ten days after hypophysectomy. In view of this finding as well as of the fact that one pronounced effect of human chorionic gonadotropin is the stimulation of the testes to produce androgen, it is impossible to be certain at present whether the maintenance of spermatogenesis by means of this gonadotropin is due to a direct action on the tubules or to an effect secondary to the stimulation of androgen production. By analogy to the female, in which the human chorionic gonadotropin certainly is not a follicle stimulator and has no gametokinetic action, one might deduce that the gametogenic effect in the male is secondary to the stimulated production of androgen. Such a deduction is supported by the fact that if a considerable period is allowed to elapse between hypophysectomy and institution of treatment, neither androgen nor chorionic gonadotropin is effective in restoring spermatogenesis, even though the latter in such a case is able to stimulate the interstitial cells quite adequately and does to a certain extent cause the tubules to enlarge. However, it has not yet been proved whether the human chorionic gonadotropin does or does not have a direct effect on the spermatogenic elements.

It must be emphasized that the rat is a rather primitive, generalized type of animal and that the foregoing observations cannot be transferred directly to man. In the instance of androgenic maintenance of spermatogenesis it is evident that the rat is a favorable species, for the observation of this maintenance reaction does not hold for the monkey [31] or even for the guinea pig.[32]

The effect of human chorionic gonadotropin on the testes of the immature monkey is primarily one of stimulating the interstitial cell growth and the production of androgen. The tubules increase in size, but no spermatogenic effect in immature monkeys has been reported.[33]

Descent of the testes in monkeys accompanies the increase in androgen production following gonadotropin treatment. The therapeutic value of the gonadotropin of pregnancy urine in cryptorchidism is discussed in a subsequent chapter.

GONADOTROPIN OF PREGNANT MARE'S SERUM

Large quantities of a gonadotropin appear in the blood of the pregnant mare during the early stages of gestation, reaching a very high titer during the middle third of the pregnancy.[25] This gonadotropin, probably of chorionic origin, differs markedly from the other known gonadotropins in the respect that the physiologic responses it evokes are an interesting blend of those produced by the gonadotropic principles of human menopausal and human pregnancy urine. Very little if any of the gonadotropin is excreted in the urine of the mare. Similarly, if an extract of the gonadotropic substance is injected into laboratory animals, the gonadotropic factor is not excreted in the urine. After intravenous administration of high doses of such an extract to normal female monkeys, only traces of the gonadotropic factor appear in the urine. Its fate after injection into women is not known.

In intact immature female rats the gonadotropin of pregnant mare's serum causes follicular stimulation, followed by luteinization and marked increases in ovarian weight. It is also able to produce definite follicular stimulation in hypophysectomized rats, an action never evoked by human chorionic gonadotropin. In the hypophysectomized female rat the action of the equine gonadotropin is similar to that of the human castrate or postmenopausal principle in ability to stimulate follicular growth and, with adequate doses, to produce granulosa luteinization. However, with the equine, though not with the human, gonadotropin thecal luteinization always accompanies even slight stimulation of follicles.[25]

When hypophysectomized male rats are given an extract of the equine gonadotropin, the responses, interstitial hypertrophy and tubular repair, are somewhat similar to those obtained with the gonadotropic material from the urine of pregnant women.[34] Liu and Noble [35] have recently administered human and equine chorionic material to hypophysectomized adult male rats. When treatment was instituted immediately after removal of the pituitary, the equine material was able to maintain spermatogenesis and accessory gland condition so that fertile matings were obtained.[34b] This is in agreement with the previously discussed observations of Smith and Leonard [28] with human chorionic gonadotropin. In the experiments of Liu and Noble the repair of the spermatogenic elements were not completely effective if treatment was delayed, even though larger doses of the mare material were employed. In connection with these observations it is instructive to recall again the fact that in rats androgen alone will maintain but not repair the spermatogenic elements.

28. Smith, P. E., and Leonard, S. L.: Responses of the Reproductive System of Hypophysectomized and Normal Rats to Injections of Pregnancy-Urine Extracts; I. The Male, Anat. Rec. **58**: 145 (Jan. 25) 1934.

29. Walsh, E. L.; Cuyler, W. K., and McCullagh, D. R.: The Physiologic Maintenance of the Male Sex Glands; The Effect of Androtin on Hypophysectomized Rats, Am. J. Physiol. **107**: 508 (Feb.) 1934. Nelson, W. O.: Some Factors Involved in the Control of the Gametogenic and Endocrine Functions of the Testis, in Cold Spring Harbor Symposia on Quantitative Biology, Cold Spring Harbor, L. I., New York, The Biological Laboratory, 1937, vol. 5.

30. Nelson, W. O.: Re-Initiation of Spermatogenesis in Hypophysectomized Rats, Am. J. Physiol. **129**: P430 (May) 1940.

31. Smith, P. E.: Comparative Effects of Hypophysectomy and Therapy on the Testes of Monkeys and Rats, in Brouha, L.: Les hormones sexuelles, Paris, Hermann & Cie, 1938, pt. 3, L'hypophyse.

32. Scowen, E. F.: The Effects of Androsterone and Testosterone on the Testes of Hypophysectomized Guinea Pigs, Anat. Rec. **70** (supp. 3): 71 (March) 1938.

33. Leathem, J. H.: Responses of Hypophysectomized Immature Female Rats to Mare Serum Hormone, Proc. Soc. Exper. Biol. & Med. **42**: 590 (Nov.) 1939.

34. (a) Smith, P. E.: Unpublished data. (b) Evans, H. M.; Pencharz, R. I.; Simpson, M. E., and Meyer, K.: Repair of the Reproductive Mechanism in Hypophysectomized Male Rats, in Lueschner, A. O., and Teggart, F. J.: Memoirs of the University of California, Berkeley, Calif., University of California Press, 1933, vol. 11, p. 301.

35. Liu, S. H., and Noble, R. L.: The Effects of Extracts of Pregnant Mare Serum and Human Pregnancy Urine on the Reproductive System of Hypophysectomized Male Rats, J. Endocrinol. **1**: 7 (June) 1939.

Studies on maintenance and repair of the testicular function of the hypophysectomized guinea pig by the gonadotropic extract from the serum of the pregnant mare have been made by Webster and Leathem.[36] The results were comparable to those of Liu and Noble with the rat. Maintenance of spermatogenesis as well as hypertrophy of the interstitial cells and accessory glands were obtained if treatment was started immediately after hypophysectomy. However, if treatment was delayed, only the interstitial cells and, consequently, the accessory glands were restored. The spermatogenic elements, though showing some improvement, were only incompletely restored.

In the female monkey the gonadotropic extract from pregnant mare's serum is a potent stimulator of follicles but produces no luteinization or fibrotic changes in the thecal wall.[25] In this respect the equine gonadotropin resembles the gonadotropic principles of the pituitary gland and human postmenopausal urine but differs markedly from the gonadotropin in the urine of pregnant women, which, if administered alone, does not cause follicular activation in the female monkey.

In the hypophysectomized adult male monkey the effects of the gonadotropic extract from the pregnant mare's serum are not similar to the effects in rodents. Smith[37] has shown that after postoperative involution of the testis the extract does not restore spermatogenic function even when the doses are high and the treatment prolonged. Smith has also pointed out that the longer treatment would probably give no better restorative effects because of the formation of antibodies against the gonadotropic substance.

The action of this substance on the gonads of men and women is discussed elsewhere.

Chemical experiments with the gonadotropin in pregnant mare's serum have yielded preparations of very high potency and considerable purity. However, even the purest of these preparations for which data are available produce physiologic effects identical with those of the crude, untreated material. This finding, if taken to indicate that the gonadotropin is a single entity, is difficult to reconcile with the claim[38] which has been made for the separation of the material into two fractions possessing qualitatively different physiologic activities. It may be that the results described in the latter report were due to a dosage phenomenon rather than to actual separation.

Any consideration of the effects of the gonadotropic extract from the serum of the pregnant mare must take into account the nonpermeability of the kidney to this material. As has been mentioned, the equine gonadotropin does not pass through the kidney into the urine as do other gonadotropins. It is not, therefore, surprising that the extract is as effective by intraperitoneal as by subcutaneous injection and by administration of a single dose as by administration of divided doses. In fact, there is evidence[39] that over short intervals a single intraperitoneal or intravenous injection is even more effective than if the same amount is divided among a number of injections. Because it is not excreted, one can presume that the gonadotropin remains in the blood stream in effective concentration, being relatively slowly inactivated or destroyed. This fact may account for some of the differences in physiologic action between this gonadotropin and its chorionic analog in the urine of pregnant women.

36. Webster, E. C., and Leathem, J. H.: Responses of Hypophysectomized and Normal Male Guinea Pigs to Mare Serum Hormone, to be published.

37. Smith, P. E.: Presidental Address, read before the Twenty-Fourth Annual Scientific Session of the Association for the Study of Internal Secretions, New York, 1940.

38. Evans, H. M.; Korpi, K.; Simpson, M. E., and Pencharz, R. I.: Fractionation of the Gonadotropic Hormones in Pregnant Mare Serum by Means of Ammonium Sulphate, Univ. California Publ. Anat. 1:275, 1936.

39. Pencharz, R. I.: Factors Influencing Ovarian Response of Normal and Hypophysectomized Rat to Pregnant Mare Serum, Proc. Soc. Exper. Biol. & Med. 42:525 (Nov.) 1939. Leathem, J. H.: The Mode of Administration as an Influence on the Effectiveness of Mare Serum Hormone in Hypophysectomized Rats, to be published.

Council on Pharmacy and Chemistry

PRELIMINARY REPORT OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING PRELIMINARY REPORT. PAUL NICHOLAS LEECH, Secretary.

GUANIDINE HYDROCHLORIDE-CALCO

A preparation of pure guanidine hydrochloride for use in the treatment of myasthenia gravis only has been presented for the consideration of the Council by the Calco Chemical Division American Cyanamid Company. Free guanidine is also known as imido-urea, occurs as a water-soluble crystalline powder, and is generally considered to have the following structural formula: $HN=C(NH_2)_2$.

The manufacturer recommends daily doses of from 10 to 35 mg. per kilogram based on recently published clinical observations of Minot and her co-workers.[1] These observers report favorable results in five cases of myasthenia gravis observed over a considerable period which were treated with prostigmine (methylsulfate or bromide) and with guanidine hydrochloride. The latter compound was administered intravenously as a 2 per cent solution in physiologic solution of sodium chloride and orally in gelatin capsules. The authors state that solutions of guanidine hydrochloride are too irritating for subcutaneous or intramuscular use. They find that persons with myasthenia gravis can take considerably larger amounts of guanidine hydrochloride continuously over a long period of time than normal persons without causing any appreciable increase in the level of guanidine in the blood or symptoms of intoxication. They are unable to explain the greater tolerance for guanidine in persons with myasthenia gravis except to offer the opinion that guanidine may be more readily stored or transformed into some other compound in this disease and to point out that the work of Wishart[2] suggests that at least part of ingested guanidine may be transformed to creatine in the muscles. The authors did not attempt a study of the effect of guanidine on creatine metabolism in the cases reported to confirm Wishart's observations that the injection of guanidine increases the creatine content of the muscles in animals.

Minot and her co-workers conclude that the treatment of five cases of myasthenia gravis with guanidine hydrochloride caused a marked and well sustained improvement in muscular function without the presence of undesirable symptoms. The authors find that the patients tolerated larger doses than normal persons for an indefinite period without producing hyperguanidinemia. They state that gastrointestinal and other undesirable symptoms appeared when significant elevation was persistently maintained in the blood, which could be relieved by atropine but served as a warning that guanidine should be temporarily reduced or withheld. The authors also observe that treatment may be combined with prostigmine, but that more evenly sustained improvement is obtained when guanidine makes up the larger part of medication. They feel that more work is necessary before any adequate explanation can be given of the effectiveness of guanidine in restoring function to muscles in myasthenia gravis. The authors recommend an initial trial dose of not more than 10 mg. per kilogram, subsequent early dosage to be adjusted according to the needs and tolerance of the patient under continuous hospital observation and controlled by blood level determinations; excessive dosage of ambulatory cases treated in practice to be avoided by temporary withdrawal of the drug on the appearance of gastrointestinal symptoms.

1. Minot, Ann S.; Dodd, Katharine, and Riven, S. S.: The Use of Guanidine Hydrochloride in the Treatment of Myasthenia Gravis, J. A. M. A. 112:553 (Aug. 12) 1939.

2. Wishart, G. M.: The Effect of the Injection of Guanidine on the Creatine Content of Muscle, J. Physiol. 53:440 (May 18) 1920.

Minot and her collaborators [3] previously outlined their hypothetical basis for the therapeutic trial of guanidine in myasthenia gravis on the theory that this substance increases the sensitivity of muscles which are subnormally responsive to normal amounts of acetylcholine in this disease, whereas prostigmine hinders the destruction of acetylcholine by the normally present enzyme choline esterase. In an unpublished manuscript they [4] have shown that the effects of prostigmine and of guanidine are entirely dissimilar in that the former in very low concentrations inactivates choline esterase, while guanidine, even in large amounts, causes no change in enzyme activity. For some unexplained reason, toxic doses of guanidine cause a slight rise in esterase activity. The authors also point out that 25 mg. per kilogram appears to be an effective but not a toxic dose of guanidine in man. Such dosage involves somewhat larger amounts than quantities previously considered toxic according to pharmacologic observations, and the reported dissimilarity between prostigmine and guanidine is interesting in view of the close resemblance in effects generally accorded these two substances by pharmacologists. Frank, Northmann and Guttmann [5] have shown that guanidine increases the sensitivity of normal muscles to the action of acetylcholine. All of these observations should be confirmed.

The Council has thus far recognized the use of ephedrine, prostigmine bromide, prostigmine methylsulfate and aminoacetic acid in the treatment of myasthenia gravis. Previous reports in the literature concerning the treatment of this disease indicate that the relative effectiveness of these drugs varies from case to case and that accurate evaluation of their comparative efficiency is rendered more difficult by the occurrence of spontaneous remissions. Since the advent of prostigmine, however, evidence has accumulated which suggests that this drug is probably one of the most effective single remedies yet developed for the treatment of the disease. Viets and Schwab [6] have reported that the results of treatment obtained in forty-four patients with myasthenia gravis over a period of two and one half years indicate that prostigmine bromide taken by mouth and supplemented with ephedrine sulfate, potassium chloride and occasionally guanidine is the most efficient form of treatment for myasthenia gravis now available. Of the forty-four patients five died, five were able to reduce the intake of prostigmine and seven showed full remissions, so that prostigmine was no longer required. The authors found that aminoacetic acid proved to be of no value in seventeen cases. Orally administered guanidine increased the effect of prostigmine in eight of twenty-five cases, in four of which results were good, whereas seventeen other patients failed to respond to guanidine; guanidine carbonate was the most satisfactory compound, but the hydrochloride was about as effective. Ephedrine sulfate enhanced the effect of prostigmine in forty-one of forty-three cases and was the most useful of the various drugs tried for this purpose. These results are partly at variance with those previously obtained and further emphasize the fact that patients with myasthenia gravis vary in their response to various types of treatment.

It should be pointed out that, according to present concepts of the action of ephedrine, prostigmine and guanidine compounds in myasthenia gravis, these substances should be regarded only as symptomatic remedies until the etiology of this disease has been established. Aminoacetic acid has been shown to exert an appreciable effect on muscle creatine retention coincident with clinical improvement in certain cases of myasthenia gravis. In the absence of a clear understanding of the possible etiologic relationship of the metabolism of muscle tissue to the disease, the choice of a therapeutic agent must be dependent on the purely empirical basis of clinical improvement. At the present time the available evidence for the value of guanidine salts alone or as an adjunct in the treatment of myasthenia gravis is not sufficient to warrant acceptance of the drug for this purpose. Not only is additional confirmatory clinical evidence necessary to establish its therapeutic value, but further experimental investigation to clarify the rationale for its use is desirable.

The Council therefore deferred further consideration of Guanidine Hydrochloride-Calco for use in the treatment of myasthenia gravis until sufficient clinical evidence to establish its value in this condition becomes available.

3. Minot, Ann S.; Dodd, Katharine, and Riven, S. S.: The Response of the Myasthenic State to Guanidine Hydrochloride, Science **87**: 348 (April 15) 1938.

4. Minot, Ann S.; Dodd, Katharine, and Riven, S. S.: A Comparison of the Actions of Prostigmine and of Guanidine on the Activity of Choline Esterase in Blood Serum, to be published.

5. Frank, E.; Northmann, M., and Guttmann, E.: Ueber diotonische Kontraktion des quergestreiften Saugetiermuskels nach Ausschaltung des motorischen Nerven: IV. Die Wirkung der Guanidine, Arch. f. d. ges. Physiol. **202**: 369, 1923.

6. Viets, H. R., and Schwab, R. S.: The Diagnosis and Treatment of Myasthenia Gravis with Special Reference to the Use of Prostigmine, J. A. M. A. **113**: 559 (Aug. 12) 1939.

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

PAUL NICHOLAS LEECH, Secretary.

CAFFEINE WITH SODIUM BENZOATE (See New and Nonofficial Remedies, 1940, p. 168).

The following dosage form has been accepted:

The Drug Products Co., Inc., Long Island City, N. Y.

Ampuls (Hyposols) Caffeine with Sodium Benzoate, N. F., 2 cc.: An aqueous solution containing in each 2 cc. caffeine with sodium benzoate-U. S. P. 0.486 Gm. (7½ grains).

PROCAINE HYDROCHLORIDE (See New and Nonofficial Remedies, 1940, p. 79).

The following dosage forms have been accepted.

Ampul Solution Procaine Hydrochloride 1%, 1 cc.: Each cubic centimeter contains procaine hydrochloride-U. S. P. 0.01 Gm. in physiologic solution of sodium chloride q. s.

Prepared by the Wm. S. Merrell Company, Cincinnati.

Ampul Solution Procaine Hydrochloride 1%, 10 cc.: Each 10 cc. contains procaine hydrochloride-U. S. P. 0.1 Gm. in physiologic solution of sodium chloride q. s.

Prepared by the Wm. S. Merrell Company, Cincinnati.

Ampul Solution Procaine Hydrochloride 2%, 1 cc.: Each cubic centimeter contains procaine hydrochloride-U. S. P. 0.02 Gm. in physiologic solution of sodium chloride q. s.

Prepared by the Wm. S. Merrell Company, Cincinnati.

Ampul Solution Procaine Hydrochloride 2%, 10 cc.: Each 10 cc. contains procaine hydrochloride-U. S. P. 0.2 Gm. in physiologic solution of sodium chloride q. s.

Prepared by the Wm. S. Merrell Company, Cincinnati.

ASCORBIC ACID (See New and Nonofficial Remedies, 1940, p. 530).

The following dosage form has been accepted:

Ascorbic Acid Tablets-Merrell, 25 mg.

Prepared by the Wm. S. Merrell Company, Cincinnati.

Tablets Ascorbic Acid, 25 Mg.

Prepared by the National Drug Company, Philadelphia.

No U. S. patent or trademark.

SULFAPYRIDINE (See New and Nonofficial Remedies, 1940, p. 494).

Sulfapyridine-Sharp & Dohme.—A brand of sulfapyridine-N. N. R.

Manufactured by Sharp & Dohme, Inc., Philadelphia. No U. S. patent or trademark.

Tablets Sulfapyridine-Sharp & Dohme, 0.5 Gm. (7.7 grains).

BUTYN SULFATE (See New and Nonofficial Remedies, 1940, p. 67).

The following dosage form has been accepted:

Butyn Sulfate Tablets, 25 mg.

THIAMIN CHLORIDE-SQUIBB (Thiamine Hydrochloride) (See New and Nonofficial Remedies, 1940, p. 530, and THE JOURNAL, Aug. 17, 1940, p. 534).

The following additional dosage form has been accepted:

Solution Thiamin Chloride-Squibb, 5 cc. Vial, 100 mg. per cc.: 8-hydroxyquinoline sulfate 0.0025 per cent is used as a preservative.

AMPULES OF CAMPHOR (See THE JOURNAL July 27, 1940, p. 303).

The following product has been accepted:

Ampuls (Hyposols) of Camphor in Oil N. F. 0.195 Gm. (3 Grains), 1 cc.: Each cubic centimeter contains camphor 0.195 Gm. (3 grains) in olive oil q. s.

Manufactured by the Drug Products Co., Inc., Long Island City, N. Y.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, JANUARY 4, 1941

HEALTH OF YOUNG MEN UNDER SELECTIVE SERVICE

The first official statistics on the results of examination of young men coming before the Selective Service Boards are now available in a statement sent to the Director of Selective Service for New York City by Col. Samuel J. Kopetzky, chief of the medical division. The total number of registrants examined by 120 local boards was 1,643. Of these 1,213 were accepted for general military service and 430 were rejected or marked "fit for limited duty only." Among the causes for rejection, 26 were for underweight, 11 for overweight, 2 for deficient height; defective vision was the primary cause of 74 rejections, diseases of the heart for 66, 28 for infantile paralysis. Whereas only 6 men were rejected because of syphilis, there were 90 men who gave a positive reaction to the Wassermann test, which caused these men to be deferred until they could be reexamined. Again the leading cause of rejection was teeth—88 men were rejected because of insufficient teeth as the main cause of rejection and 20 additional had insufficient teeth as a secondary cause.

Such figures as those here cited have been widely heralded in many places as the basis for a campaign in behalf of some new method of prevention and treatment of disease in the United States. It has been urged that we are a nation of "physical weaklings" and that some sort of national health program is immediately necessary to improve our physical health. Actually, however, this sample of those rejected does not show any specific deterioration in the population. By comparison with previous records, it indicates that the general health of our nation is good. The standards of evaluation today are far more rigid than those which were utilized in 1917. The roentgen ray for determining the presence or absence of diseases of the lung and the modern technics for examining various portions of the body, laboratory methods for the detection of changes in the blood, the Wassermann test and similar methods of study were not used in examination of recruits in World War I.

In a bulletin just issued by the Metropolitan Life Insurance Company it is pointed out that "America's youth today is more fit to serve the country than any previous generation, including the youth of the World War." A large proportion of the rejections, it is indicated, are for ailments that are minor and often remedial and, in any event, not a bar to rigorous activity in civilian life. The improvement in the physical health of our nation is shown, of course, by lower sickness and death rates affecting those in the draft ages. In 1917-1918 about 10 per cent of the draftees were rejected because of manifest tuberculosis. The mortality from that disease has declined 75 per cent in the last quarter century among men of draft ages. Among men of the ages of 21 to 35 the reduction in heart disease mortality among those holding policies in this insurance company was 40 per cent for white men and 60 per cent for the Negroes. Our knowledge of diet, our greatly increased understanding of many diseases of the glands, the improvement in child health that has taken place in the past twenty years—all this evidence indicates that from the point of view of physical fitness we are a far better nation now than we were in 1917.

The evidence here developed should not lead us, however, to the belief that we have attained an optimum in physical fitness. The twenty-eight cases of rejection because of crippling injuries resulting from infantile paralysis are a reminder of the devastation wrought among children by this disease in the New York area in 1916. Those children are now in the draft ages. An estimate by Dr. Paul A. Neal of the National Institute of Health indicates that 60 per cent of all disabilities will be due to defects of eye and ear, mechanical defects and conditions of the heart and kidneys among the 6,000,000 men who will be examined. Many of these constitute conditions which are susceptible of rehabilitation or improvement with proper medical advice, enabling these men to be fit for limited service if not for complete military service. Approximately 140,000 men will be rejected because of tuberculosis. Not every one of them can be restored to a useful life in civilian affairs, but proper treatment and proper education may do much to lessen the chance that these men may become the foci of dissemination of this disease.

The problem of rehabilitating the men who are found to be physically or mentally defective by the Selective Service Boards is one which is being given serious consideration by many different agencies. Certainly every man who is found defective should be informed of the reasons for his rejection or deferment so that he may be given an opportunity to do the utmost on his own behalf and to utilize to the utmost the services available in his own community for rehabilitation.

V 19

In a recent address, Mr. Paul V. McNutt, coordinator of all health and welfare activities affecting the national defense, said "The task of absorbing the impact of these developments is essentially one which the local community must face squarely. . . . Responsibility for working out these essentially local problems is one which can be met primarily through the efforts of local citizens, both those who are in professional activities and those who are operating on a voluntary capacity. This is work which will require careful planning, close coordination, intelligent leadership and unity." The results of the examinations made by the Selective Service Boards and the induction boards are a challenge to the medical profession, to the social scientists, the physical educators, the public health officials and all of those concerned in the United States with the physical improvement of our population. In a recent address by Pres. William J. Hutchins of Berea College, published in the current issue of *Hygeia*, this challenge was sharply stated: "The defense of our nation cannot be entrusted to a race of adult morons, whose children are spawned into the world, to die like flies. The nation's defense cannot be entrusted to men, such as fill the venereal wards of our hospitals, such as filled the venereal sections of our army camps in the Great War. No more can our nation's defense be entrusted to men whose gangs surround our saloons and pool rooms, whose sole evidence of will power is the tenacity with which their teeth hold their cigarettes."

Scientific honesty and truth demand that we look at the problem of the people's health and evaluate the available figures clearly and justly. Again and again THE JOURNAL has pointed out that from the point of view of the national health and of physical fitness the American people can place their record well up beside that of any other nation in the world. Those who argue that this record is due primarily to the superior living conditions which have long prevailed in the United States cannot discount the achievements of modern medicine or the part played by the public health movement and medical organizations in this country. We are not a nation of "physical weaklings." Among the 16,000,000 men registered under the Selective Service Act, there can be found without too intensive a combing a sufficient number for training not only this year but in the years to come. However, the greatest asset of any nation is the health of its citizens. The detection of correctable deformities and disabilities is a problem for the medical profession. The rehabilitation of those who can be benefited is again a problem which rests primarily on the medical profession. The assumption of proper responsibilities by local, county, state and national agencies, each according to the share that it must bear in our democratic system of government, is equally desirable.

THE PHYSICIAN AND THE OFFICIAL INDUSTRIAL HYGIENE AGENCIES

A survey of activity in the field of industrial hygiene in the United States [1] draws attention to the increase in the number of official consulting and investigative agencies in this field. State and federal governments as well as other agencies are expanding their programs. The range of medical activity in industrial health is so widespread and frequently of such special character as to require the services of physicians in many categories of public and private employment. Physicians in industry may be classified according to whether preventive or remedial services preponderate in their ordinary activities. At one extremity is the medically trained industrial hygienist, concerned mainly with the elimination of environmental and personal factors underlying lost time in industry. At the opposite end is the private physician in general or special practice, who is most frequently called by employers or insurance organizations to treat individual cases of compensable industrial disability. The industrial physician bridges the space between these two extremes of professional approach. He applies the principles of preventive medicine and surgery in relationship to specific working conditions and also treats accidents and diseases of occupational origin in keeping with the employer's legal responsibility. Physicians in each of these classifications have indispensable functions to perform for industry. The actual share of the total preventive medical activity which industry needs and which these varying types of physicians undertake will vary widely in keeping with local requirements. In the inevitable expansion of industrial medicine the work of physicians in all these groups must greatly increase.

Medical leadership has the responsibility for developing proper orientation in industrial health. From the evidence presented in the survey by the United States Public Health Service, opportunities for constructive services are great. Since the private practitioner treats all nonoccupational causes of lost time and a majority of occupational causes as well, reductions in industrial absenteeism rest largely in his hands. He should extend his acquaintance with industrial exposures and his competence to correct them. He should report injuries and diseases promptly to the official agencies responsible for their control and he should call on them for advice and consultation whenever local facilities for such services are incomplete or absent.

Public health administrators will find it advantageous to promote a sustained interest and watchfulness on the part of individual physicians who desire to serve more competently and extensively in this field. They should underwrite the programs which medical organizations are developing with this end in view. In the absence of enough trained personnel, existing facilities for investigation of industrial health exposures provided by

1. Pub. Health Bull. 259, U. S. Public Health Service, 1940.

individuals and by individual laboratories need to be fostered and supplemented.

If suitable relationships between public and private agencies are borne in mind, investigation and consultation in industry can be undertaken with the full understanding and active assistance of the interested professional groups. Too often, in the past, there has been failure to arrange cooperation. This failure must be recognized and surmounted if the best interests of the worker are to be paramount.

BIOLOGIC SPECIFICITY OF MITOCHONDRIA

Demonstration by Henle and Chambers[1] of the University of Pennsylvania that mammalian mitochondria are organ specific and not species specific may result in radical revisions in current theories in the fields of allergy, immunology and endocrinology. The possibility that the different organs of the same individual may be of different immunochemical specificity was effectively eliminated by earlier investigators. Emulsions of different organs injected into rabbits almost invariably gave rise to the same species specific antibodies. With the crude technics of the time the observed differences were apparently merely quantitative in nature. The conclusion was therefore drawn that every human tissue cell was wholly human in its biologic specificity. For twenty-five years this unitarian concept was accepted. The first definite challenge came from a study of the antigenic properties of lens proteins. These were found to be organ specific rather than species specific. Since then, numerous other organ specific substances have been discovered, prominent among which are thyroglobulin and the Forssman lipoid. Kidney specific lipoids, brain specific lipoids and carcinoma specific substances have been described, with numerous other tissue products intermediary between organ specific and species specific in their biochemical classification. The human body thus ceases to be completely human in its tissue specificity and has been described as a "physiological composite of an amphibian kidney, lower mammalian liver and human reticuloendothelial system."

The current contribution of Henle and Chambers to this newer theory was a by-product of research on viruses. Previous investigators[2] had found that granules of the same size as the influenza virus, for example, can be separated from normal mammalian tissues. Chemical and tinctorial properties of these granules suggest that they are mainly mitochondria. In order to differentiate between these normal intracellular particles and viruses, Henle and his co-workers studied their serologic specificity. Frozen organs of healthy Swiss mice, for example, were ground with sand to form a 10 to 20 per cent suspension. After low speed centrifugation the resulting supernatant fluids were passed through a Mandler filter and then subjected to prolonged high speed centrifugation (25,000 revolutions per minute). The high speed sediments were washed three times in the high speed centrifuge and finally tested for their specific antigenic properties on rabbits. The material thus tested apparently consisted of a pure suspension of mitochondria, each particle being from 0.1 to 0.3 micron in diameter and readily staining with the usual mitochondrial dyes.

Rabbit antiserum obtained by repeated intravenous injections of these mitochondrial suspensions agglutinated homologous mitochondria within one minute in their routine slide test. Brain mitochondria were found to be wholly organ specific; antiserums did not cross agglutinate with granules isolated from the kidney, liver, lung, muscle, pancreas, spleen or testicle. In contrast, antikidney mitochondrial serums gave strong cross reactions with liver granules and weak cross reactions with muscle granules. Antisplenic serum was relatively nonspecific, reacting with granules of all other organs thus far tested. The cross reactions were thus similar to those previously reported by Sachs and other European investigators from their study of alcohol extractable tissue lipoids.

Using mitochondria derived from a second animal species—the ferret—the authors showed that liver and brain mitochondria are immunochemically identical in at least two animal species. Kidney mitochondria contain both organ specific and species specific fractional antigens. Whether or not mitochondria can function as autogenous vaccines has not yet been determined.

1. Henle, Werner, and Chambers, L. A.: Science 92:313 (Oct. 4) 1940.
2. Claude, Albert: Science 91:77 (Jan. 19) 1940.

Current Comment

NORWICH CAPITALIZES ON COLDS

Many Americans with little regard for health will take any kind of unauthoritative advice on the proper treatment of disease. Poorly educated cultists, radio announcers reading advertising scripts, and careless or unethical pharmacists do not hesitate to prescribe for disease conditions. For years some manufacturers of medicinal products have persistently used such agencies in the promotion of their products. Thus a recent circular issued by the Norwich Pharmacal Company of Norwich, N. Y., boldly urges drug clerks to practice medicine:

"We have, undoubtedly, the most complete line of Cold Prevention products on the market. *We have a full line of items for aid in the relief and treatment of the active symptoms of Colds. These are all Norwich products,* with the high quality and scientific development that characterizes the House of Norwich. *They are all to be sold by you to the consumer* with the guarantee of money back if not completely satisfied. These items are listed on the back page. Now is the time to feature and display these items."

Note particularly the phrases *"the relief and treatment of the active symptoms of Colds"* and *"they are all to be sold by you to the consumer."* This is not the prevention of colds. It tells the druggist to prescribe treatment for the active cold. This journal has repeat-

edly condemned practices which tend to promote counter prescribing by the druggist.[1] Again and again THE JOURNAL has pointed out [2] the dangers inherent in self medication. Several years ago an investigator, feeling that he was coming down with a cold, visited seven different drug stores in Chicago and asked for remedies for his cold. With one exception, he obtained in each drug store three items. The bill for the three items averaged $2. None of these remedies duplicated others. Some were entirely useless, some might have given temporary symptomatic relief; others were prescriptions which were apparently pet hobbies of the druggists "consulted." The seventh druggist suggested that the investigator return to his home, go to bed and call a physician, adding that the undertaker across the street was exceedingly busy during this particular period, taking care of the people who had not obtained proper advice for the treatment of their colds.

WHAT IS YOUR "R. R. Q."?

The "racket resistance quotient" of many a doctor is low. The term, coined by the Bulletin of the Essex County Medical Society,[1] serves to remind us of the opinion of high pressure salesmen that doctors are easy marks. There is the newspaper photograph racket! The photographer says "We like to have photographs of our leading citizens. We want your picture for our files. There is no charge." Usually the flattering offer, if accepted, is followed by a visit from a seductive damsel who brings the proofs in person and who knows how to sell photographs. Then there are the solicitors for organizations devoted to movements for charitable and uplifting purposes who invade the office and consume valuable time. The best defense is an adequate contribution to the Community Chest and limitation of other contributions to organizations and institutions in which the physician has a special interest. Conspicuous among rackets is solicitation of contributions by telephone. The solicitor mentions the names of prominent people, flattering the doctor by mentioning his name with distinguished company or possibly threatening that such people will consider him miserly unless he too contributes. Do not hesitate to reject telephone demands from unidentified persons. The free encyclopedia is an artful business wile. The doctor is so distinguished that the publisher is proud to have him on his list of owners, merely for the recommendation. The doctor will, of course, want to keep the encyclopedia up to date by purchasing the annual supplement. After he signs, he will find that the supplement costs $12 or so a year for many years. However, for $20 or so in cash he can be released from a long term contract. Have you ever cashed a check for a new patient which called for several dollars more than the fee? And did the check bounce? It did! Have you received a letter bearing a foreign postage stamp telling you that a Spaniard in a foreign jail has lots of money in a secret compartment in a trunk which is awaiting release from a United States custom house as soon as the customs duty has been paid? Did you send money to get the trunk released, understanding that half of the contents would be yours? Some doctors bought a share in that trunk. Did it contain valuables? No, brother, it did not! This fraud is at least two hundred years old. Last August doctors all over the country got a chance to bite. Several other examples of rackets are reported in the news columns in this issue. Faith in human nature is beautiful but, remember, charity still begins at home. There is no chagrin like that of the sucker who suddenly realizes that sympathy is seldom the solace of the fish.

1. Warning to Prescribing Druggists, Medical News, J. A. M. A. 94: 1001 (March 29) 1930. Why Druggists Prescribe, Current Comment, ibid. 110: 290 (Jan. 22) 1938. Counter and Radio Prescribing, Correspondence, ibid. 110: 831 (March 12) 1938.
2. Bromo-Seltzer, Current Comment, J. A. M. A. 112: 2292 (June 3) 1939. Double Barreled Self Medication, ibid. 115: 387 (Aug. 3) 1940.

1. What's Your R. R. Q.? Bulletin of the Essex County Medical Society, October 1940.

STANDARDS FOR PRIVATE GROUP CONTRACT PRACTICE

The directors of the Group Health Federation of America, an organization composed of representatives of various agencies interested in the practice of medicine by groups of physicians, met in St. Louis, October 18-19, to examine answers to a long questionnaire which had been sent to representatives of ten group health plans. The purpose was to determine whether or not the plans met ten basic standards adopted in June 1940. Dr. Kingsley Roberts, medical director of the Bureau of Cooperative Medicine and chairman of the accrediting committee of the federation, said in a bulletin of the bureau for October 18:

The ten standards for accrediting group health plans are summarized as follows:

1. A program of medical care and preventive medicine must be built around the general practitioner.
2. The physician must not be restricted in methods of diagnosis and treatment and there must be no interference in the physician-patient relationship.
3. The plan must have equipment and facilities to provide a high quality of medical care and to assure full performance of the services promised.
4. Physicians must receive adequate compensation.
5. The types and amounts of health services provided to subscribers must be specifically and fully described.
6. General physicians, specialists and nurses must be fully qualified for their work.
7. The plan must be economically and financially sound.
8. The rates must not be excessive or inadequate.
9. Statistical records must be maintained and submitted to the Group Health Federation of America.
10. Administrative policies must conform to professional ideals. No profit-making sales organization shall be given responsibility for promotion or administration.

Since the directors who are to do the standardizing are apparently members of groups, some questions may be in order regarding some of the standards. How can the second and third standards be enforced against the financial managements of the groups? If "administrative policies must conform to professional ideals"—the tenth standard—what codification of ideals will be followed? There is only one official codification of professional medical ideals—the Principles of Medical Ethics of the American Medical Association. With regard to these same standards it might also be asked whether or not a small group of physicians practicing medicine under contracts is or is not a "profit-making sales organization."

MEDICAL PREPAREDNESS

In this section of The Journal each week will appear official notices by the Committee on Medical Preparedness of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medical preparedness, and such other information and announcements as will be useful to the medical profession.

MEDICAL SUPPLIES FOR GREECE

The Medical and Surgical Supply Committee of America, New York, announces that its facilities have been expanded to enable shipping medical supplies and foods to the civilian population of Greece. Heretofore, the committee has concentrated its war relief efforts to aiding noncombatants in Great Britain. The committee seeks contributions in the way of medical supplies and foods and cash for the purchase of these materials. Checks may be made out to Arthur Kunzinger of the Chase National Bank, treasurer, and mailed to the committee's headquarters, 420 Lexington Avenue, New York.

PHYSICIANS WANTED FOR CCC CAMPS

Vacancies now exist in the CCC in the Eighth Corps Area wherein the services of physicians can be utilized as camp physicians. Applicants for these positions must be graduates of class A medical schools, must be licensed to practice medicine in at least one state and must be physically qualified. Applications should be addressed to The Surgeon, CCC, Eighth Corps Area, Fort Sam Houston, Texas.

If selected, physicians must report to their first duty station at their own expense and, on being relieved from duty, return transportation must also be at the expense of the individual. They will be required to furnish necessary medical treatment to the personnel of CCC camps and in addition will be required to perform such other duties as may be directed by their superior officers.

RADON PRODUCTION PLANT GIVEN TO ENGLAND

Radiologists in England have been forced by German bombers to abandon most of their clinical work with radium owing to the danger of losing radium, although research is going ahead in other branches of medicine and physics despite the war. The British War Relief Society in New York City, at the urgent request of the British Hospitals Association, has cabled $25,000 to London to establish a subterranean plant for the production of radon, an emanation product of radium that can be effectively used as a substitute. This American sponsored radon unit will provide radium treatment for the 50 per cent of cancer patients in Great Britain who have been unable to have that aid since the Germans began bombing Great Britain. The head of the British War Relief Society, Mr. Winthrop W. Aldrich, chairman of the board of the Chase National Bank, said that the radon bank will be set up far from the reach of bombs and would be under the direction of Prof. Sidney Russ, chief of the department of biophysics at the Middlesex Hospital Medical School. Professor Russ already has one small radon plant in operation which supplies half of England. Radon is a gas given off by radium and is as powerful as radium itself for a few days, according to Gioacchino Failla, physicist at the Memorial Hospital in New York, and it can be used in the same way as radium. After a few days, however, the radon tubes lose their effectiveness and become then completely harmless should they be lost. Radon was discovered simultaneously by Mme. Curie in France and by Sir Ernest Rutherford in England and was first used in 1913 in the treatment of cancer.

ARMY RESERVE OFFICERS ORDERED TO ACTIVE DUTY

SECOND CORPS AREA

The following additional medical reserve corps officers had been ordered to active duty by the Commanding General, Second Corps Area, up to December 20. The Second Corps Area comprises the states of New York, New Jersey and Delaware.

AMATO, Louis L., 1st Lieut., New York, 2d Military Area.
CANDILORO, Carl G., Captain, New York, 2d Military Area.
D'ARTA, Edward J., 1st Lieut., Brooklyn, 2d Military Area.
EICHNER, Daniel H., Captain, New York, 2d Military Area.
KWINT, Joseph A., 1st Lieut., North Plainfield, N. J., 3d Military Area.
LIPTON, Harold, Captain, Brooklyn, 2d Military Area.
MOORE, Joseph M., Captain, New York, 2d Military Area.
NADLER, Julius, 1st Lieut., Brooklyn, 2d Military Area.
REID, Charles D., Captain, Syracuse, N. Y., 1st Military Area.
SHAPIRO, Benjamin, 1st Lieut., Jackson Heights, N. Y., 2d Military Area.
SHEERAN, James D., 1st Lieut., Brooklyn, 2d Military Area.

THIRD CORPS AREA

The following additional medical reserve corps officers had been ordered to extended active duty by the Commanding General, Third Corps Area, up to December 13. The Third Corps Area comprises the states of Pennsylvania, Virginia, District of Columbia and Maryland.

CIACCIA, Nicholas Louis, 1st Lieut., Pittsburgh.
COPE, Fredrick Trevor, 1st Lieut., Philadelphia.
FITZPATRICK, James Joseph, 1st Lieut., Pittston, Pa.
FRIEDMAN, Joseph Marshall, 1st Lieut., Washington, D. C.
FUGITT, Elmer Wink, Captain, Washington, D. C.
GOLDMAN, Sidney Saunders, Major, Philadelphia.
MARYANOV, Lawrence, 1st Lieut., Vienna, Md.
POTTER, Richard Chute, Jr., 1st Lieut., Marion, Va.
STEINBERG, Morris William, 1st Lieut., Baltimore.

FOURTH CORPS AREA

The following additional medical reserve corps officers have been ordered to active duty by the Commanding General, Fourth Corps Area, since Dec. 13, 1940. The Fourth Corps Area comprises the states of Tennessee, North Carolina, South Carolina, Alabama, Georgia, Mississippi, Florida and Louisiana.

ADAMO, Frank S., Lieut. Col., Tampa, Fla.
ALEXANDER, Lassar, 1st Lieut., Miami, Fla.

ANNIS, Jere W., 1st Lieut., Lakeland, Fla.
BUCHNER, Edward F., 1st Lieut., Chattanooga, Tenn.
CANIPELLI, Edward, 1st Lieut., Jacksonville, Fla.
CANIZARO, Vito J., 1st Lieut., Vicksburg, Miss.
CLACK, John M., 1st Lieut., West Point, Ga.
CUTTINO, John T., 1st Lieut., Columbia, S. C.
DURST, George G., 1st Lieut., Greenwood, S. C.
ESSRIG, Irving M., 1st Lieut., Tampa, Fla.
FAULKNER, Roscoe, 1st Lieut., Trenton, Tenn.
FOWLER, Shelton F., 1st Lieut., Nashville, Tenn.
GARY, Robert E., 1st Lieut., Tuscumbia, Ala.
GRIFFIN, James C., 1st Lieut., Tampa, Fla.
GRIZZARD, Thomas, 1st Lieut., Goodlettsville, Tenn.
HAINES, Charles E., Jr., 1st Lieut., Durham, N. C.
HULL, Joseph A., 1st Lieut., DeKalb, Miss.
INGLE, Charles W., Jr., 1st Lieut., Memphis, Tenn.
KEELS, Lucius B., 1st Lieut., Bishopville, S. C.
KAPLAN, Saul H., 1st Lieut., Miami Beach, Fla.
KING, Joseph H., 1st Lieut., Summerton, S. C.
LEFHOLZ, Rothwell, 1st Lieut., Coral Gables, Fla.
LESTER, Roy T., 1st Lieut., Coushatta, La.
McLANE, Francis C., 1st Lieut., Abbeville, S. C.
McRAE, Cameron F., Jr., 1st Lieut., Mars Hill, N. C.
MARTIN, Benjamin F., 1st Lieut., Winston-Salem, N. C.
OVERTON, Fred W. T., Captain, Nashville, Tenn.
POOLE, Harold L., 1st Lieut., Spartanburg, S. C.
POWELL, Cuthbert E., 1st Lieut., Swainsboro, Ga.
SHELTON, George W., 1st Lieut., Manchester, Tenn.
STARZYNSKI, Florian B., Captain, Birmingham, Ala.
TEASLEY, Gerald H., 1st Lieut., Athens, Ala.
TREHERNE, Alfred J., Captain, Atmore, Ala.
WHITMAN, Oscar F., 1st Lieut., Statesboro, Ga.
WORLEY, Wyeth B., 1st Lieut., Shreveport, La.

Relieved from Duty

The following officers previously reported have been relieved from duty or their orders have been revoked:

CHAMBERS, Wallace L., 1st Lieut., Pickens, Miss.
EDELSON, Edmond K., 1st Lieut., New Orleans.
HAY, Floyd B., 1st Lieut., Byrdstown, Tenn.
MARTIN, Carl T., 1st Lieut., Haleyville, Ala.
SCOTT, Wood H., 1st Lieut, Bonita, La.
SLIPAKOFF, Leon, 1st Lieut., New Iberia, La.
SORRELLS, John E., 1st Lieut., Iowa, La.
STOVALL, James T., Jr., 1st Lieut., Jefferson, Ga.
YOUNG, Henry D., Jr., 1st Lieut., Bushnell, Fla.

SIXTH CORPS AREA

The following additional medical reserve corps officers had been ordered to extended active duty by the Commanding General, Sixth Corps Area, up to December 20. The Sixth Corps Area comprises the states of Wisconsin, Illinois and Michigan.

APPELMAN, Howard B., Captain, Detroit.
BASS, Howard H., Captain, Chicago.
BROWNSTEIN, Stanley, 1st Lieut., Chicago.
CONN, Harold, 1st Lieut., Detroit.
DeGROAT, Albert, Captain, Detroit.
DeSALVO, Michael F., 1st Lieut., Madison, Wis.
DOKTORSKY, Abraham, 1st Lieut., Chicago.
FELDMAN, Nathaniel LeR., Captain, Detroit.
GOLDBERG, Aaron L., 1st Lieut., Chicago.
GUTMAN, Emil, 1st Lieut., Chicago.
KOBRIN, Meyer W., 1st Lieut., Gary, Ind.
LEVENSON, Joseph M., 1st Lieut., Chicago.
LINK, Gustave S., 1st Lieut., Chicago.
NEAL, Lowell A., 1st Lieut., Mattoon, Ill.
MARCHMONT, Robinson Harry, 1st Lieut., Chicago.
MILLARD, Allen LaM., Major, Marshfield, Wis.
OLWIN, John H., 1st Lieut., Chicago.
OWEN, Clarence I., Major, Detroit.
PALMER, Algernon A., Captain, Chelsea, Mich.
PEARLMAN, Maurice D., 1st Lieut., Chicago.
ROMANSKI, Arthur F. S., 1st Lieut., Berwyn, Ill.
ROSEN, Irving Isadore, 1st Lieut., L'Anse, Mich.
ROSENBLOOM, Harold H., Captain, Chicago.
ROSENGARD, Jerome L., Captain, Chicago.
SASS, Louis A., 1st Lieut., Chicago.
SINTZEL, Alois R., Captain, Belleville, Ill.
STAFFORD, Wilfred F., 1st Lieut., Mattoon, Ill.
STANLEY, Arthur Lavic, 1st Lieut., Pontiac, Mich.
STARSIAK, Casimir R., 1st Lieut., Chicago.
STOLL, John E., Major, Chicago.
SURRELL, Matthew A., 1st Lieut., Newberry, Mich.
SWIFT, Frederick J., 1st Lieut., Chicago.
THEIS, Edward H., Major, Granite City, Ill.
WALKER, Enos G., Major, Detroit.

SEVENTH CORPS AREA

The following additional medical reserve corps officers had been ordered to active duty by the Commanding General, Seventh Corps Area, up to December 20. The Seventh Corps Area comprises the states of North Dakota, South Dakota, Minnesota, Nebraska, Iowa, Kansas, Missouri, Arkansas and Wyoming.

ANDRE, Gaylord Ross, 1st Lieut., Lisbon, Iowa, Fort Sam Houston, Texas.
DWORAK, Arthur Francis, Captain, St. Paul, Fort Bliss, Texas.
EVERITT, Neill Jay, Lieut. Col., Omaha, Surgeon's Office of Seventh Corps Area, Omaha.
KRANSON, Seymour Julian, Captain, Independence, Mo., Fort Bliss, Texas.

NINTH CORPS AREA

The following additional medical reserve officers had been ordered to extended active duty by Ninth Corps Area order up to December 14:

ADAMS, Elliott L., 1st Lieut., Lodi, Calif., Presidio of Monterey and Fort Ord, Calif.
ARNOWITZ, Isaac, 1st Lieut., San Francisco, Fort Scott, San Francisco.
BARTLETT, John C., 1st Lieut., Berkeley, Calif., Presidio of San Francisco, Calif.
BODE, Arnold G. H., 1st Lieut., Sierra Madre, Calif., Presidio of Monterey and Fort Ord, Calif.
BUSH, George, 1st Lieut., Long Beach, Calif., Fort MacArthur, Calif.
CANNING, Thomas E., 1st Lieut., Colville, Wash., Fort Lewis, Wash.
CARLILE, Thomas B., 1st Lieut., Seattle, Fort Lewis, Wash.
CHAMPOUX, Clement G., 1st Lieut., Selah, Wash., Camp Clatsop, Ore.
COFFELT, Ralph W., 1st Lieut., Los Angeles, Presidio of Monterey and Fort Ord, Calif.
CRONIN, Daniel J., 1st Lieut., San Francisco, Presidio of San Francisco, Calif.
DeBUSK, Fred G., 1st Lieut., Visalia, Calif., Camp McQuaide, Calif.
DEMPSEY, Thomas F., 1st Lieut., San Bernardino, Calif., Presidio of San Francisco, Calif.
FOWLER, John D., 1st Lieut., Los Angeles, Fort MacArthur, Calif.
GOLD, Rubin L., 1st Lieut., San Francisco, Presidio of Monterey and Fort Ord, Calif.
KRIEGER, Sherburne, 1st Lieut., Los Angeles, Camp McQuaide, Calif.
LANDERS, Clyde H., 1st Lieut., Altadena, Calif., Presidio of Monterey and Fort Ord, Calif.
LAWTON, Latham B., Captain, Jackson, Wyo., Fort F. E. Warren, Wyo.
MAXIMOV, Nicholas G., 1st Lieut., San Francisco, Presidio of Monterey and Fort Ord, Calif.
OWENS, Raymond W., 1st Lieut., Oildale, Calif., Camp McQuaide, Calif.
PARROTT, Robert M., 1st Lieut., Tacoma, Wash., Fort Lewis, Wash.
SPISHAKOFF, Nathan M., 1st Lieut., Los Angeles, 41st Division, Camp Murray, Wash.
UNSELL, Ira M., 1st Lieut., Santa Monica, Calif., 29th Engineer Battalion, Portland, Ore.
ZIDE, Harry A., 1st Lieut., Los Angeles, Presidio of Monterey and Fort Ord, Calif.

NEW NAVY MEDICAL OFFICERS

The following physicians are reported to have qualified by examination for appointment in the Medical Corps of the U. S. Navy and were commissioned assistant surgeons with rank of lieutenant (junior grade), October 2:

BLALOCK, Tully T., Charleston, S. C.
BROWN, Walter E., Rocky Mountain, N. C.
CHASTEN, Stephen M., Stoughton, Wis.
CUNNINGHAM, John J., Pensacola, Fla.
DRUCKEMILLER, William H., New York.
FUELLING, James L., Newburgh, Ind.
GIOTTA, Peter J., Bronx, New York.
JANUS, William L., Philadelphia.
KANE, John J., Beaufort, S. C.
KELLER, John H., M. C., China Grove, N. C.
KULIESIS, Adolph P., Mattapan, Mass.
MacKOSE, William F., Beaver Dam, Wis.
MARKOWITZ, Herbert A., Washington, D. C.
MILLER, Myles R., Kennett Square, Pa.
MOLLRING, Grant F., Smithfield, N. C.
RENAUD, Oliver V., Brooklyn.
SIESS, Eugene E., Los Angeles.
SNOWDEN, William M., Philadelphia.
STONE, Evan C., Jr., Minot, N. D.
WRIGHT, Donovan G., Oak Park, Ill.

ORGANIZATION SECTION

OFFICIAL NOTES

RADIO BROADCASTS

"Doctors at Work" is the title of the sixth annual series of dramatized radio programs being presented by the American Medical Association and the National Broadcasting Company.

The series opened Wednesday, Nov. 13, 1940, and will run for thirty consecutive weeks, closing with a broadcast from the A. M. A. meeting at Cleveland on June 4. The program is scheduled for 10:30 p. m. eastern standard time (9:30 central, 8:30 mountain, 7:30 Pacific time) over the Blue network, other N. B. C. stations and Canadian stations.

The programs are broadcast on what is known in radio as a sustaining basis; that is, the time is furnished gratis by the radio network and local stations, and no revenue is derived from the programs. Therefore, local stations may or may not take the programs, at their discretion, except those stations which are owned and operated by the National Broadcasting Company.

Some radio stations may be unable to broadcast the program at the regular scheduled time and may transcribe and broadcast it at another hour or even on another day. It is advisable therefore to verify the time by reference to local newspapers or by telephoning the local Blue network stations.

The programs will dramatize what modern medicine offers the individual in the way of opportunities for better health and the more successful treatment of disease. Incidental to this main theme the programs will explain the characteristics of the different fields of modern medicine and its specialties.

Descriptive posters for local distribution may be had gratis from the Bureau of Health Education, American Medical Association, 535 North Dearborn Street, Chicago. Program titles will be announced weekly in THE JOURNAL and monthly in *Hygeia*, The Health Magazine.

Tickets are available for each broadcast. Address the Bureau of Health Education, American Medical Association, 535 North Dearborn Street, Chicago. Tickets are free, but a stamped self-addressed envelop should accompany requests.

The next three programs to be broadcast, together with their dates and their titles, are as follows:

January 8. Your Eyes.
January 15. Best Foot Forward.
January 22. Blocking Pain.

Mail received from radio listeners to "Doctors at Work" has indicated a wide acceptance of the program as an interesting entertainment feature as well as a source of information. Letters received represent many shades of opinion, including those of physicians, teachers, clergymen, mothers and business men.

ADDRESSES BY OFFICIAL STAFF

DR. PAUL C. BARTON:
Jan. 20—Woman's Auxiliary to the North Side Branch of the Chicago Medical Society, Chicago.

DR. W. W. BAUER:
Jan. 6—Chicago Medical Society, Woman's Auxiliary, North Shore Branch, Chicago.
Jan. 6—Elgin Lions Club, Elgin, Ill.
Jan. 9—Pennsylvania Health Institute, Harrisburg.
Jan. 13—High School, Manitowoc, Wis.
Jan. 13—Manitowoc County Medical Society, Woman's Auxiliary, Manitowoc, Wis.
Jan. 13—Rotary Club, Manitowoc, Wis.
Jan. 16—Atwood Heights Parent Teacher Association, Blue Island, Ill.
Jan. 18—American Association of University Women, Elgin, Ill.

DR. MORRIS FISHBEIN:
Jan. 10—Commonwealth Fund, New York.
Jan. 14—Chicago Philanthropic Club, Chicago.
Jan. 15—Indiana Livestock Breeders' Association, Lafayette, Ind.
Jan. 29—Chicago Woman's Club, Chicago.

DR. FRANK H. LAHEY:
Jan. 11—Connecticut State Medical Society, New Haven, Conn.
Jan. 13—Johns Hopkins Medical Society, Baltimore.
Jan. 17—Newton Center Men's Club, Newton Center, Mass.
Jan. 30—Lackawanna County Medical Society, Scranton, Pa.

DR. CARL M. PETERSON:
Jan. 18—Secretaries' Conference of the West Virginia State Medical Association, Charleston.

DR. PAUL A. TESCHNER:
Jan. 10—Chicago Boys Club, Chicago.
Jan. 14—Lake View Woman's Club, Chicago.
Jan. 24—Cook County Federation of Women's Clubs, Chicago.

DR. NATHAN B. VAN ETTEN:
Jan. 10—Pennsylvania Health Institute, Harrisburg.
Jan. 10—Lycoming County Medical Society, Williamsport, Pa.
Jan. 21—Junior League, New York.
Jan. 28—Woman's Auxiliary, Nassau County Medical Society, Garden City, N. Y.

WOMAN'S AUXILIARY

Oregon

The annual Health Education Day program and tea sponsored by the auxiliary to the Multnomah County Medical Society was held October 28. Dr. George E. Henton, one of the councillors for the Oregon State Medical Society, spoke on "The Program of the Oregon State Medical Society to Provide Care for the Low Wage Group." Members of all outstanding women's organizations in the city were issued a general invitation by letter to their respective presidents. This was followed by a personal printed invitation to individual members. Auxiliary members were asked to be responsible for one guest. The auxiliary held a combined November and December meeting in the Medical Dental Building Auditorium on November 25. After the regular business meeting Miss Nell A. Unger, head librarian of the Library Association of Portland, spoke on "Reading for Pleasure."

Wisconsin

The Milwaukee County auxiliary, Mrs. C. D. Partridge, president, met October 11 in Milwaukee. Mrs. William Liefert reported on the Red Cross work done during the summer and Mrs. Gerald H. Friedman, state chairman of Hygeia, presented the state program for 1940-1941. Two interesting speakers featured the November meeting of the auxiliary. Dr. Ralph P. Sproule, president of the state medical society, talked on "Social Problems Confronting the Medical Profession." "Axis Bid for Africa" was the subject of the talk by Dr. Howard J. McMurray, professor of political science at the University of Wisconsin Extension Division. At the November meeting of Milwaukee County's study group, Mrs. Edgar Behnke gave a paper on an eastern medical plan. Mrs. Ervin Hansher led the study group.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CONNECTICUT

Changes in Health Officers.—The *Connecticut Health Bulletin* announces the following appointments of health officers:

Dr. Joseph Bruce Crook, of East Haddam.
Dr. John S. Stanesław, of Prospect.
Dr. Andrew O. Laakso, of Killingly, succeeding Dr. George S. Lambert.
Dr. Martin L. O'Neill, Jewett City, of Voluntown, succeeding Dr. John H. McLaughlin, Jewett City.
Dr. Oscar Rogel, of Oxford.

Course on Diseases of Nutrition.—The Clinical Congress of the Connecticut State Medical Society will open a postgraduate course on the diseases of nutrition at Yale University School of Medicine, New Haven, January 9, to continue each Thursday for fourteen weeks. Subjects covered in the course include:

The Nature and Functions of Dietary Constituents.
Carbohydrate Interrelationships.
Protein and Fat Deficiencies.
General Characteristics and Properties of Vitamins—The Problem in Man.
Water, Sodium, Iodine, Potassium and Magnesium in Health and Disease.
Calcium, Phosphorus and Vitamin D.
Vitamin B Deficiency.
Vitamin A, C, K (P).
Iron and Hemopoietic Factors.
Pathology of Dietary Deficiencies.
The Calculation of Diets.

DISTRICT OF COLUMBIA

Postgraduate Course in Ophthalmology.—A preliminary announcement has been received concerning a postgraduate course in ophthalmology to be given at the George Washington University School of Medicine, Washington, April 7-12. Guest lecturers will include:

Dr. James H. Allen, Iowa City, Treatment of the Staphylococcic Infections of the Eye with Special Reference to Immunotherapy.
Dr. Arthur J. Bedell, Albany, N. Y., Diseases of the Fundus Oculi.
Dr. Francis Bruce Fralick, Ann Arbor, Mich., Anatomy of the Eye.
Dr. LeGrand H. Hardy, New York, Orthoptic Training.
Dr. Parker Heath, Detroit, Ocular Therapeutics.
Dr. Peter C. Kronfeld, Chicago, Ocular Tuberculosis.
Dr. Angus L. MacLean, Baltimore, Reading Disabilities.
Dr. James I. Moore, Baltimore, Use of X-Rays and Radium in Ophthalmology.
Dr. Joseph Earle Moore, Baltimore, Ocular Syphilis.
Dr. Algernon B. Reese, New York, Glaucoma.
Dr. Bernard Samuels, New York, Pathology of the Eye.
Dr. Theodore L. Terry, Boston, Cataract Surgery.
Dr. James Watson White, New York, Disturbances of Ocular Motility.

A symposium on refraction will be a feature of the course with Drs. Walter B. Lancaster, Hanover, N. H., Allen Greenwood, Boston, and Sylvester Judd Beach, Portland, Maine, as the speakers. Members of the staff of the department of ophthalmology of the university who will participate in the course will include:

Dr. William Thornwall Davis, Headache.
Dr. Ernest A. W. Sheppard, Ophthalmic Lenses.
Dr. G. Victor Simpson, Telescopic and Contact Lenses.
Dr. Edgar Leonard Goodman, Preparation of Material for Animal Surgery.
Dr. Ronald A. Cox, Physiology and Disease of the Lacrimal Apparatus.

FLORIDA

Personal.—Dr. Carroll T. Bowen, Jacksonville, director of venereal disease control for the Duval County health unit, has been appointed director of the Broward County health unit, with headquarters in Fort Lauderdale.——Dr. Erwin F. Hoffman, Detroit, has been appointed health officer of Hendry County, succeeding Dr. Charles W. Pease, who was transferred to Jacksonville.—Dr. Walter L. Shackelford, for thirteen years superintendent of the Good Samaritan Hospital, West Palm Beach, has resigned to enter private practice.

ILLINOIS

Typhoid Traced to Carrier.—A woman typhoid carrier was believed to be the source of an outbreak of typhoid in the Pleasant Hill School in Tazewell County in October, involving ten school children. All the patients had eaten luncheon served at the school. An examination of fecal specimens from the six persons who had worked in connection with the luncheon service showed typhoid bacilli in the specimen taken from one woman. This woman gave a history of typhoid in 1916. She was removed from work as a food handler, and all the pupils, other than those ill, were vaccinated against typhoid. It was recommended that all other contacts of the patients be vaccinated also.

Chicago

Daily News Appoints Science Editor.—Mr. James C. Leary, who has been specializing in science writing on the staff of the Chicago *Daily News* for the past several years, has been named science editor of that paper.

Branch Meetings.—Dr. Grover C. Penberthy, Detroit, addressed the Jackson Park Branch of the Chicago Medical Society, December 19, on "Treatment of Burns."——Dr. Walter C. Alvarez, Rochester, Minn., discussed "Abdominal Pain" before the Calumet Branch, December 20.

Dr. Phemister Named to New Professorship.—Dr. Dallas B. Phemister, professor of surgery and chairman of the department, University of Chicago School of Medicine, has been designated the first holder of the newly created Thomas D. Jones professorship. The new chair was recently established to honor the late Thomas Davies Jones, pioneer Chicago attorney and industrialist, who died in 1930. Mr. Jones had been a major benefactor of the University of Chicago, its medical school and the Frank Billings Medical Clinic. Born in Carbondale, Ill., in 1882, Dr. Phemister received his degree in medicine in 1904 from Rush Medical College. He has been a member of the staff of the University of Chicago since 1925 and is a past president of the American Surgical Association and of the Society of Clinical Surgery.

MICHIGAN

Personal.—Dr. George Louis LeFevre, Muskegon, was honored recently when the Muskegon County Medical Society *Bulletin* was dedicated to him. Dr. LeFevre was president of the county medical society in 1905 and again in 1922 and has been medicolegal adviser of the society since 1915. In 1920 he was elected to the council of the Michigan State Medical Society, serving his district until his election as president of the state society in 1933.—The Tuscola County Medical Society and local residents recently honored Dr. George Bates, Kingston, with a reception to observe his completion of fifty years in the practice of medicine.

Annual Battle Creek Conference.—The annual Battle Creek Medical Conference was held at the Battle Creek Sanitarium, December 3. It is sponsored by the Calhoun County Medical Society, the sanitarium, the Battle Creek Academy of Medicine and Dentistry, and the combined staffs of Leila Post Montgomery, American Legion and Community hospitals. Included among the out of state speakers were:

Dr. James Roscoe Miller, The Treatment of Cardiac Decompensation.
Dr. Cleveland J. White, Treatment of Common Skin Diseases.
Dr. David E. Markson, Newer Developments in the Medical Treatment of Arthritis.
Dr. James K. Stock, Surgical Treatment of Arthritis.
Dr. Michael L. Mason, The Immediate Care of Raw Surfaces.
Dr. Arthur E. Mahle, Gastroenterology in General Practice.

All are on the staff of Northwestern University Medical School, Chicago. Dr. Morris Fishbein, editor of THE JOURNAL, Chicago, gave an address at the banquet.

MINNESOTA

Dr. Ivy to Deliver Judd Lecture.—Dr. Andrew C. Ivy, Nathan Smith Davis professor of physiology and head of the department of physiology and pharmacology at Northwestern University Medical School, Chicago, will deliver the eighth E. Starr Judd Lecture at the University of Minnesota in the Medical Science Amphitheater, January 15. His subject will be "The Mechanisms of Gastric Secretion." The late Dr. Edward Starr Judd, an alumnus of the Minnesota medical school, established this annual lectureship in surgery a few years before his death.

Supreme Court Refuses Review of Suspension of Homeopath's License.—The Supreme Court of the United States announced its refusal, November 12, to review the case in which the Minnesota State Board of Medical Examiners had suspended for five years the license of Dr. Gottfried Schmidt, Lake City. Dr. Schmidt's license was suspended Dec. 16, 1938 following a hearing before the board when it was charged that he was guilty of immoral, dishonorable and unprofessional conduct as defined by law. It was disclosed that Dr. Schmidt had attempted to diagnose cancer, ulcers and other serious conditions by the use of a piece of wood pulp

paper moistened with the patient's saliva. The moistened paper was placed on the abdomen of either the patient or a woman subject employed by Dr. Schmidt in his office at Lake City. He also claimed that he had a machine with which he could broadcast treatments to absent patients. Following the suspension of his license, Dr. Schmidt appealed to the District Court of Ramsey County. After a hearing before Judge Carlton F. McNally, the court affirmed the action of the medical board, holding that the board's action "was neither arbitrary, oppressive nor unreasonable." Dr. Schmidt then appealed to the Supreme Court of Minnesota, which court, May 17, handed down a unanimous opinion written by Justice Royal A. Stone affirming the District Court of Ramsey County. Then Dr. Schmidt served notice of appeal to the Supreme Court of the United States. Dr. Schmidt was born in Minnesota in 1871 and graduated at the University of Minnesota College of Homeopathic Medicine and Surgery, Minneapolis, in 1903.

MISSOURI

Sauer to Be Deported.—Rudy H. Sauer, "a practical male nurse," was recently sentenced to imprisonment for a year and a day for violation of the Harrison Narcotic Law and will be deported to Canada. On November 7 Sauer was found by police and narcotic agents in St. Louis in illegal possession of narcotics. A federal warrant charging violation of the narcotic laws was issued against Sauer November 10. It was alleged that he entered "medical practice" and affixed the title "Dr." to his calling card after receiving a physician's medical kit from a friend. Sauer was arrested after he had inserted an advertisement in two afternoon newspapers in St. Louis for a girl "of pleasing personality to assist a doctor." The mother of a girl interviewed asked the police to question "Dr." Sauer. The police reported finding narcotic tablets in the kit. Sauer is said to have admitted later that he had administered narcotics to a man as a treatment for insomnia.

NEW JERSEY

Nweeya Poses as Medical Missionary.—A New Jersey physician reports a fraud in which the swindler posed as a medical missionary, selling a book he had written on his experiences in Persia. The man said that his name was Samuel K. Nweeya, that he was a graduate of the University of Pennsylvania and that he was a friend of various physicians in New Jersey. He displayed a list of subscriptions containing seventy or more names of prominent physicians in and near Newark. His story was that he had been forced to return to the United States because of his wife's health and that he was selling the book to obtain funds for her treatment. One physician gave him a check for $3, which was endorsed with a nonexistent address.

NEW YORK

Survey of Mental Hospitals.—Governor Lehman has appointed an unofficial commission to make a survey of ways and means of reducing admissions to and the population of state mental institutions. Homer Folks, secretary of the State Charities Aid Association, is chairman of the commission and others invited to serve are:

Dr. Karl M. Bowman, director, psychiatric division, Bellevue Hospital, and professor of psychiatry, New York University College of Medicine, New York.
Dr. Clarence O. Cheney, medical director, New York Hospital, Westchester Division, White Plains.
Miss Hester B. Crutcher, director of psychiatric social work, state department of mental hygiene, Albany.
Stanley P. Davies, executive director, Community Service Society of New York.
Dr. William J. Tiffany, Albany, state commissioner of mental hygiene, Albany.
Dr. Lawrence Kolb, assistant surgeon general, U. S. Public Health Service, Washington, D. C.
Dr. Frederick W. Parsons, former state commissioner of mental hygiene, New York.
Dr. William L. Russell, consulting psychiatrist, Payne Whitney Psychiatric Clinic, New York.
Dr. Nolan D. C. Lewis, director, New York State Psychiatric Institute and Hospital, and professor of psychiatry, Columbia University College of Physicians and Surgeons, New York.
Dr. George S. Stevenson, medical director, National Committee for Mental Hygiene, New York.

New York City

The Janeway Lecture.—Dr. Irvine H. Page, director of the Lilly Laboratory for Clinical Research, Indianapolis, will deliver the Edward Gamaliel Janeway Lecture at Mount Sinai Hospital, January 10, on "The Nature of Experimental and Clinical Hypertension."

Professor of Orthopedic Surgery Appointed.—Dr. Alan DeForest Smith, clinical professor of orthopedic surgery at Columbia University College of Physicians and Surgeons, has been appointed professor. He succeeds Dr. Benjamin P. Farrell, who retired June 30. Dr. Smith also succeeded Dr. Farrell as surgeon in chief of the New York Orthopedic Dispensary and Hospital.

Annual Medical-Dental Meeting.—The annual combined meeting of the first and second district dental societies and the five county medical societies of New York was held at the Hotel Pennsylvania, December 2. A symposium on focal infection was presented at the morning session by Drs. William B. Rawls and Samuel Weiss, New York, and Joseph L. T. Appleton, D.D.S., Philadelphia. In the afternoon a symposium on acute infections of the face and neck was presented by Dr. Oscar V. Batson, Philadelphia, Dr. Charles Gordon Heyd and Malcolm Wallace Carr, D.D.S.

Instruction in Obstetrics.—The New York Academy of Medicine will present a series of lectures in obstetrics for practitioners beginning January 8 with an address by Dr. Charles A. Gordon, Brooklyn, on "Immediate Treatment of Hemorrhage." Subsequent lectures will be:

January 15, Dr. Arthur J. Murphy, Urinary Tract Complications in Pregnancy, Labor and the Puerperium.
January 22, Dr. Herman O. Mosenthal, Diabetes in Pregnancy.
January 29, Dr. Nicholson J. Eastman, Baltimore, Asphyxia in the Newborn.
February 5, Dr. Philip F. Williams, Philadelphia, Metabolism in Pregnancy, Including Vitamin Deficiency.

Meeting of Chest Physicians.—The New York State chapter of the American College of Chest Physicians will hold a session at the Hotel Biltmore, January 17, with the following speakers:

Dr. Chevalier L. Jackson, Philadelphia, Bronchoscopy in Diseases of the Chest.
Dr. Wilbur Emory Burnett, Philadelphia, Surgery of Carcinoma of the Lung.
Dr. Leonard Greenburg, state department of labor, Industrial Pulmonary Diseases.
Dr. Edgar Mayer, Tuberculosis in the Army Under Present Epidemiologic Conditions.
Dr. Arthur Q. Penta, Schenectady, Postoperative Atelectasis: Diagnosis, Prevention and Treatment.
Dr. James S. Edlin, Artificial Pneumothorax in the Treatment of Pulmonary Tuberculosis.

Anatomy Department Honors Former Professor.—The department of anatomy of New York Medical College, Flower and Fifth Avenue hospitals was formally designated the "William Waldo Blackman Laboratory of Anatomy" at a ceremony, November 19. Conrad E. Tharaldsen, Ph.D., professor of anatomy, presided at the meeting and William K. Gregory, Ph.D., professor of vertebrate paleontology, Columbia University, and curator of the department of comparative anatomy at the American Museum of Natural History, made the principal address, on "Evolutional Causes of the Misery of Mankind." Dr. Blackman is an alumnus, former professor of anatomy and president of the college alumni association and is now vice chairman of the board of trustees.

OREGON

Society News.—A symposium on shock was presented at the meeting of the Multnomah County Medical Society, Portland, November 20, by Drs. Aubrey M. Davis, Bradford N. Pease, DeWitt C. Burkes and Charles H. Manlove. Drs. William K. Livingston and Martin A. Howard were the speakers, December 4, on "Diseases of the Arteries" and "Diseases of the Veins" respectively.

Course on Diseases of the Chest.—The University of Oregon Medical School and the Pacific Northwest Section of the American College of Chest Physicians offered a postgraduate course on diseases of the chest at the school, December 13-14. Chairmen at the sessions were Drs. Grover C. Bellinger, Salem; John E. Nelson, Seattle; Orval F. Swindell, Boise, Idaho, and Frank I. Terrill, Deer Lodge, Mont. Dr. Thomas M. Joyce, professor of surgery at the medical school, gave a lecture at a dinner meeting at the University Club on treatment in cancer of the esophagus.

PENNSYLVANIA

First State Health Institute.—The Pennsylvania Department of Health, in cooperation with the Medical Society of the State of Pennsylvania, the state departments of public instruction, public assistance and welfare, the state dental and nursing organizations, the U. S. Children's Bureau and the

U. S. Public Health Service, will present a health institute in Harrisburg, January 8-10. Among speakers at the sessions will be:

Dr. John J. Shaw, state secretary of health, The Role of the Department of Health, Organized Medicine, Local Departments of Health and the Voluntary Agencies in the Modern Health Plan.
Dr. Francis F. Borzell, Philadelphia, president of the state medical society, Organized Medicine in a Community Health Program.
Dr. Erval Richard Coffey, U. S. Public Health Service, the Federal Government and Community Health.
Dr. LeRoy U. Gardner, Saranac Lake, N. Y., Public Health Aspects of Industrial Hygiene and the Part of the Health Departments in the Problem.
Dr. James R. Martin, Philadelphia, The Crippled Child.
Dr. Ralph M. Tyson, Philadelphia, Child Health.
Clair E. Turner, Dr.P.H., Cambridge, Mass., The Old and the New in Health Education.
Dr. William D. Stroud, Philadelphia, The Social Component in Heart Disease with Special Reference to the Rheumatic Heart.
Dr. Herbert C. Woolley, Philadelphia, The Deficient and Mentally Ill.

At a banquet Thursday evening Governor James and Dr. Howard E. Milliken, mayor of Harrisburg, will be guests, and speakers will be Dr. William W. Bauer, director, Bureau of Health Education, American Medical Association, Chicago, on "What the Public Is Thinking About Health"; Dr. Arthur T. McCormack, Louisville, Ky., "A Lifetime Spent in Public Health," and Mr. John McCullough, of the staff of the Philadelphia *Inquirer*, "Health Is News." At a luncheon Friday Dr. Nathan B. Van Etten, New York, President of the American Medical Association, will speak on "American Medicine Organizes for National Defense." The Bureau of Public Health Nursing of the state health department will conduct a maternity institute for registered nurses in Harrisburg, January 13-17, and one in Pittsburgh, January 20-24.

Philadelphia

Society News.—Drs. Louis H. Clerf and Arthur J. Wagers, among others, addressed the Philadelphia Laryngological Society, December 3, on "Photographic Study of the Larynx by Mirror Laryngoscopy" and "Case of Severe Epistaxis Presenting Problems as to Etiology, Determination and Origin and Methods of Control" respectively.——Drs. Clyde H. Kelchner, Allentown, Pa., and Morris A. Bowie, Bryn Mawr, Pa., addressed the Philadelphia Rheumatism Society, December 5, on "Fibrositis" and "Joint Physiology" respectively. —— Dr. Waldo E. Nelson addressed the Philadelphia Pediatric Society, December 10, on "Role of Excessive Carbohydrate Intake in the Etiology of Diabetic Acidosis" and Drs. Francis C. Dohan and Francis D. W. Lukens, "Effect of Early Treatment in Experimental Diabetes." —— Dr. John Scudder, New York, addressed the Philadelphia Urological Society, December 16, on "Shock: Blood Studies as a Guide to Therapy."

TENNESSEE

Personal.—Dr. Charles B. Roberts, Sparta, entertained the White County Medical Society recently at a dinner in honor of Dr. Sanford E. Gaines, Sparta, who has completed fifty years in the practice of medicine. The guest speaker was Dr. Charles E. Reeves, Gainesboro, who paid tribute to Dr. Gaines. —— Dr. William B. Farris, Tazewell, has been appointed health officer of Williamson County to succeed Dr. Roscoe Faulkner, Batesville, Miss.——Dr. Warren C. Ramer, Trenton, has been appointed head of the Henderson-Decatur county health unit to succeed Dr. James C. Armstrong, now of Jefferson City, resigned.——Dr. Tinsley R. Harrison, Nashville, recently received the honorary degree of master of science from the University of Michigan Medical School, Ann Arbor. —— Dr. John B. Youmans, associate professor of medicine, Vanderbilt University School of Medicine, Nashville, has gone to Europe as a member of the Health Commission of the Rockefeller Foundation, according to *Science*.

TEXAS

Hospital News.—Dr. Samuel M. Hill, Dallas, has donated a library wing to St. Paul's Hospital, Dallas. It will have a capacity of about 3,000 books and will be under the direction of a full time librarian.——Dr. Lucius R. Wilson, superintendent of the John Sealy Hospital, Galveston, since 1928, resigned to became superintendent of the Hospital of the Protestant Episcopal Church of Philadelphia, January 1.

Woman Swindles Physicians.—The J. B. Lippincott Company, Philadelphia, reports that a woman using the name of Tess Frazier is defrauding physicians in Texas by selling two year subscriptions to the *Digest of Treatment* for $5, which is the subscription price for one year. Her technic appears to be to get renewals at a special price for cash in advance. The woman does not represent the Lippincott Company.

Society News.—Drs. Geneva Ernestine Smith and Elisha F. Meredith addressed the Dallas County Medical Society, Dallas, November 14, on "Diagnosis and Treatment of Pneumococcic Meningitis" and "Comparison in Treatment of Pneumonia in Children" respectively.——Dr. Joseph G. Gathings, Houston, among others, addressed the Hunt-Rockwall-Rains County Medical Society, Greenville, November 12, on "Gonorrheal Vulvovaginitis in Immature Females."

WASHINGTON

Society News.—The King County Medical Society met jointly with the Seattle District Dental Society, December 2, in Seattle with the following speakers: O. T. Dean, D.D.S., on "Local and General Anesthesia in Dentistry" and Dr. Edwin G. Bannick, "Problem of Focal Infections in Internal Medicine." ——Dr. Otto M. Rott, Spokane, Wash., addressed the Walla Walla Valley Medical Society in November on "What Can Be Done to Prevent Deafness and to Aid the Hard of Hearing." ——A program on heart disease was presented before the Whitman County Medical Society, Colfax, December 5, by Drs. Paul G. Weisman, Colfax, James L. Gilleland, Pullman, and Randall W. Henry, Endicott.

WISCONSIN

In Honor of Dr. Frank Billings.—Milwaukee Sanitarium at Wauwatosa has just dedicated its twentieth building and named it the Billings House in honor of the late Dr. Frank Billings of Chicago, who for twenty-five years was a director. Billings House is a beautiful home, the setting among the trees offering quiet, comfort and refinement to the patients. Dr. Billings was also for many years dean of the faculty of Rush Medical College, a Trustee of the American Medical Association and one of its former presidents. He died Sept. 20, 1932. The medical director of the Milwaukee Sanitarium is Dr. Rock Sleyster, who also is a former President of the American Medical Association.

GENERAL

Changes in Obstetrics Board.—Drs. Norman F. Miller, Ann Arbor, Mich., and Willard R. Cooke, Galveston, Texas, have been elected members, directors and examiners of the American Board of Obstetrics and Gynecology. They succeed Drs. Jennings C. Litzenberg, Minneapolis, and Grandison D. Royston, St. Louis, who resigned, October 15.

Bovine Tuberculosis Program Completed.—The last two counties in the last state, California, have been certified as accredited counties in the twenty-three year testing program for the eradication of bovine tuberculosis, the U. S. Department of Agriculture announces. The degree of infection in every county in every state has now been reduced to less than 0.5 per cent, signifying virtual eradication. The task of testing cattle with tuberculin was begun in 1917 and has involved more than two hundred and thirty-two million tests and retests. About four million tuberculous cattle were removed for slaughter. During the campaign, a new tuberculin was developed for testing, which detects about 10 per cent more tuberculous animals than that used in early tests, it was pointed out. Continued retesting will be necessary, it was said, especially in herds from which infected animals have recently been removed. The late J. A. Kiernan, who died in 1927, was the first federal veterinarian in charge of the project and it has been continued under the direction of A. E. Wight.

Physicians Warned of Narcotic Addict.—Physicians are warned of a morphine addict who is a suspect in the murder of a physician in Detroit about twelve years ago. His description as reported by the Wayne County Medical Society reads: 37 years of age, 5 feet 5 inches tall; weight 110; sallow complexion; black hair; has scars on the left wrist and lower right limb which, he claims, are caused by osteomyelitis. The addict uses the names Robert McDonald, Paul Brown and Paul Murray, but his true name is said to be James Shannon. The man is also wanted by the government for violation of section 28 of the criminal code and for parole violation in Ohio. Detroit authorities recently traced Shannon to Toledo, but he eluded them, going to Louisville, Ky. Any one hearing of this person is asked to notify the local bureau of narcotics or Ralph H. Oyler, district supervisor, 802-810 Federal Building, Detroit.

Physicians Complain of Book Agent.—A physician from Kentucky writes that the International American Company, 201 North Wells Street, Chicago, has not been fulfilling its contracts made through an agent to sell encyclopedias for a fixed amount. The contract calls for $29.50 for a set of eight

volumes of the International American Encyclopedia and stipulates that on completion of the payments one copy of Webster's Unabridged Dictionary will be sent to the purchaser. The contract reads "Pay Representative First Payment Only. Balance as Specified." One B. L. Martin has been the agent involved. One physician paid the amount in full and received neither the encyclopedia nor the dictionary, while others who paid partial amounts received one or the other. The Chicago Better Business Bureau has received similar complaints involving B. L. Martin. According to complaints in the bureau, Mr. Charles E. Knapp of the International American Company writes that Martin has limited authority to collect up to $14.75 and that in those cases in which the amount had been paid in full Martin evidently had not sent in the orders.

Accident Racketeer.—A West Virginia physician recently reported a swindler who used a fracture to obtain money from an insurance company and absconded without paying his medical bills. The man, who was obese, rented an apartment in one of the modern buildings in Charleston. He called the physician late the first night with a story of having sat in a chair in his apartment, having fallen and hurt his back. He did not wish the physician to call, but visited the office the next day. A roentgenogram showed a fracture of the coccyx. He refused to stay in bed, made many calls to the physician's office and traveled to various towns in the vicinity to sell screen advertising. A second roentgen examination six weeks after the alleged injury showed the same fracture, the physician reported. Subsequently the "patient" made a settlement with the insurance company covering the liability of the apartment house and immediately departed with the check, which included allowances for the fees of the first physician consulted, an orthopedic surgeon and the roentgenologist. He also tricked some merchants with promises of screen advertising which never came and took small amounts of money from these men. The swindler gave his name as Arthur Loevin of Indianapolis, Los Angeles and New York.

Sectional Ear, Nose and Throat Meetings.—The annual sectional meetings of the American Laryngological, Rhinological and Otological Society are announced. The Southern Section will meet in Nashville, Tenn., January 8, with the following speakers, among others:

Dr. Elmer James Mulligan, Baltimore, Treatment of Acute Frontal Sinus Infection.
Dr. William de G. Mahoney, Nashville, Ménière's Syndrome.
Dr. John J. Shea, Memphis, Tenn., Nasal Tumors of Pituitary Origin: Report of Case.
Dr. Roy A. Barlow, Charles Town, W. Va., The Neglected Ethmoid Headache.
Dr. Walter A. Wells, Washington, D. C., Danger to the Hearing Apparatus in Modern Warfare.

The Eastern Section will meet in Philadelphia, January 10, at the Bellevue-Stratford Hotel. The speakers will include:

Dr. Wilfred D. Langley, Sayre, Pa., Allergic Rhinitis.
Dr. Albert D. Ruedemann, Cleveland, "Pop-Eye."
Dr. William D. Province, New York, Sulfathiazole.
Dr. Karl Kornblum, Philadelphia, The Present Status of Roentgen Therapy in Sinusitis.

The Middle Section meeting will be at the Drake Hotel, Chicago, January 27, with the following speakers, among others:

Melvin H. Knisely, Ph.D., Chicago, Dr. Warren K. Stratman-Thomas and Theodore S. Eliot, Ph.D., Memphis, Tenn., Microscopic Observations of the Changes in the Blood and Circulation in Living Animals.
Stacy R. Guild, Ph.D., Baltimore, War Deafness and Its Prevention.
Capt. Cole D. Pittman, Chanute Field, Ill., The Relation of High Altitude Flying and Rapid Changes of Atmospheric Pressure to Otolaryngology and Its Effect on the Middle Ear and Accessory Sinuses in Military Aviators.
Dr. Paul H. Holinger, Chicago, Esophageal Perforations and Complications.

The Academy of Orthopaedic Surgeons.—The ninth annual convention of the American Academy of Orthopaedic Surgeons will be held at the Roosevelt Hotel, January 12-16, in New Orleans. The guest speakers will be:

Drs. Ernst Bergmann and Arthur Krida, New York, Aseptic Necrosis and Bone Drilling.
Dr. Edward W. Alton Ochsner, New Orleans, Thrombophlebitis and Postphlebitic Edema.
Dr. Harold B. Boyd, Memphis, Tenn., Congenital Pseudoarthrosis.
Dr. Murray M. Copeland, Baltimore, Classification of Bone Tumors According to Radiosensitivity.
Dr. Edward A. LeCocq, Seattle, Use of Neoarsphenamine in the Treatment of Acute Osteomyelitis with Associated Staphylococcic Septicemia: A Clinical and Experimental Study.
Dr. Gerald G. Gill, San Francisco, An Accurate Method for the Estimation of the Expected Growth of the Femur and Tibia in Individual Children.
Drs. Allen F. Voshell and Otto C. Brantigan, Baltimore, Some Mechanical Derangements of the Knee.
Dr. Beveridge H. Moore, Chicago, A Study of End Results in Bone Lengthening.
Dr. J. Albert Key, St. Louis, Comparison of Stainless Steel and Vitallium as Material for Internal Fixation of Bone.
Dr. Norman T. Kirk, colonel, medical corps, U. S. Army, Washington, D. C., Organization for Evacuation and Treatment of War Casualties.
Dr. Alberto F. Inclan Jr., Habana, Cuba, Use of Preserved Bone Grafts in Orthopedic Surgery.

Dr. Robert D. Schrock, Omaha, will deliver his presidential address Wednesday afternoon, January 15. The program also includes a clinical program at Tulane University of Louisiana School of Medicine. Entertainment will consist of a cocktail party, reunion dinners and banquet.

Symposium on Alcoholism.—The Research Council on Problems of Alcohol sponsored a symposium on alcoholism December 27-29 in Philadelphia during the winter meeting of the American Association for the Advancement of Science. Subjects of the sessions were "Physiological and Chemical Considerations of Alcohol," "Clinical Aspects of Alcoholism," "Neuropsychiatric Features of Alcoholism," "Treatment and Prevention of Alcoholism" and "Social and Legal Problems of Alcoholism." The final session was a public meeting at which Dr. Thomas Parran, surgeon general, U. S. Public Health Service, Washington, D. C., was to preside and Dr. Abraham Myerson, Boston, was the speaker on "The Social Pharmacology of Alcoholism." Among the speakers at the sessions were:

Dr. Andrew C. Ivy, Chicago, The Influence of Alcohol on the Alimentary System.
Drs. Frederick A. Gibbs and Hallowell Davis, Boston, Electroencephalographic Changes Produced by Alcohol.
Dr. Arthur W. Wright, Albany, N. Y., The General Pathology and Some Special Complications of Alcoholism.
Dr. Anton J. Carlson, Chicago, The Need for Further Investigation of Alcoholism from the Standpoint of the Biological and Clinical Sciences.
Dr. Foster Kennedy, New York, Neurological Conditions Encountered in Chronic Alcoholism.
Dr. David Wechsler, Corona, N. Y., The Effect of Alcohol on Mental Activity.
Dr. Robert V. Seliger, Baltimore, Treatment of the Alcoholic Addict.
Dr. Bernard Glueck, Ossining, N. Y., A Critique of Present-Day Methods of Treatment of Alcoholism.
Dr. Lawrence Kolb, U. S. Public Health Service, Washington, D. C., Alcoholism and Public Health.
Edwin R. Keedy, LL.D., University of Pennsylvania Law School, Philadelphia, Alcoholism and Legal Responsibility.
Donald S. Berry, National Safety Council, Chicago, Alcohol and Traffic Accidents.
Dr. George S. Stevenson, medical director, National Committee for Mental Hygiene, New York, Education and Control of Alcoholism.

Unlicensed Practitioner Held as Draft Evader.—Physicians in West Virginia and Pennsylvania have reported the activities of a man who for months has been posing as a physician and is now being held as a draft evader. The man first appeared in the spring of 1940 at the headquarters of the West Virginia Medical Association, giving his name as S. S. Strauss and saying that he was a graduate of Long Island College of Medicine, Brooklyn, and that he was licensed to practice in West Virginia. He obtained positions doing relief work in various towns in the coal fields but disappeared when it became known that he was not licensed and had not graduated from the Long Island college. A notice in the *West Virginia Medical Journal* in October warned physicians to look out for Strauss. Immediately after publication of this notice "Dr." Strauss was found practicing, and when the article was shown to him he confessed that he was not a physician, according to the *West Virginia Medical Journal* for November. In the latter part of October a man who seemed to be the same appeared in a Pennsylvania town calling himself Charles F. Straub. A physician of whom he asked help in finding a position referred him to an opening in West Virginia. At this time the applicant said that he had graduated from Tulane University of Louisiana School of Medicine, had served an internship in Charity Hospital, New Orleans, had passed examinations of the National Board of Medical Examiners, and had had special training in pediatrics at Charity Hospital and at the Mayo Clinic, Rochester, Minn. Tulane and the Mayo Clinic reported they had no record of Charles F. Straub. A report, dated December 23, states that Strauss went to Kingwood, W. Va. The state police took him in custody as a suspicious character and discovered that, while his automobile license was in the name of Samuel Strauss, his draft registration card bore the name Kreiger. The police notified the U. S. Department of Justice, which sent back a police record dating from 1933. Names he has used include Seymour Rothchild, Seymour Davis Strauss, Milton Fenberg, Seymour Strauss, Samuel Liebowitz and Samuel Seymour Strauss. His activities have been carried on in California, Pennsylvania, Virginia, Ohio, Missouri, New York and West Virginia. They include sentences in various penal institutions for using the mails to defraud and one for vagrancy. The man was being held in jail in Kingwood for the next meeting of the federal grand jury on a charge of registering for the draft under an assumed name.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Nov. 16, 1940.

A Bombed Hospital and Ambulance Depot

What happens when a direct hit occurs is shown in the press this morning. A hospital, an ambulance station and a nursing home were hit by bombs in a night air attack. At the hospital 7 patients and 1 sister were killed. A high explosive bomb crashed through a window on the ground floor of a block in which chronically ill patients—aged women, crippled and infirm—were housed. Five of these were killed outright and 2 others died later. The sister, who was in her office beside the window through which the bomb entered, was killed immediately. Other women in the hospital sustained slight injuries. Three bombs also fell in the hospital grounds and damaged the water supply.

In another district a school which was being used as a fire station and ambulance depot was wrecked by bombs. Several people, most of them firemen, were killed. The ambulance unit included several women, some of whom were in the basement of the building when the bomb exploded, but only 2 were injured. Nearly all the ambulances were destroyed. One ambulance driver was removing seriously injured firemen to a hospital when a second bomb exploded. It blew off the roof of his ambulance, but he continued on his journey and after handing over his patients collapsed from shock.

Casualties from Air Attacks on Britain

In the House of Commons the Prime Minister, Mr. Churchill, referred to Hitler's threat that on September 4, if we did not bend to his will, he would wipe out our cities. But they were still standing and were quite distinctive objects on the landscape, and our people were going about their tasks with the utmost activity. The casualties amounted to fourteen thousand civilians killed and twenty thousand seriously wounded, of which four fifths were in London. As against this, scarcely three hundred soldiers had been killed and five hundred wounded. The full malice of the enemy and his bombing force had been employed against us, but the scale of the attack had dwindled. The weekly average of casualties (killed and seriously wounded) for September was four thousand five hundred and for October three thousand five hundred. In the first week of the intensive bombardment of September there were six thousand casualties, in the last week of October only two thousand. The casualties have been nothing like the scale anticipated before the war. Great London hospitals singly made preparations to deal with as many as one thousand casualties from a single raid.

The official figures for the month of October, which have just been issued, show that six thousand three hundred and thirty-four civilians were killed and eight thousand six hundred and ninety-five injured and detained in hospitals. The killed consisted of two thousand seven hundred and ninety-one men, two thousand nine hundred women and six hundred and forty-three children under the age of 16 years; the injured, of four thousand two hundred and twenty-eight men, three thousand seven hundred and fifty women and seven hundred and seventeen children. The number killed in September was six thousand nine hundred and fifty-four and in August one thousand and seventy-five. The government is considering the question of insurance against the risk of death in air raids. Insurance companies are offering to insure against this risk at an annual premium of 1 per cent, but in the House of Commons a member asked the government to undertake the insurance at 0.1 per cent, which he claimed would yield large profits.

Ear Injuries in Warfare

At the Section of Otology of the Royal Society of Medicine a discussion took place on war injuries of the ear. Mr. Lionel Colledge said that the injuries caused by explosions were of two classes: those with gross tympanic injury and those of concussion of the labyrinth without signs of tympanic injury. Direct wounds of the temporal bone in war must be fairly common, but many were not recorded, probably because they were often immediately fatal. If a projectile could not be extracted through the meatus, the proper route was a retroauricular incision.

Miss D. Josephine Collier discussed ear injuries in the civil population during air raids, mainly on the basis of her experience in the Spanish civil war. Injuries of the middle ear could be divided into two groups, those produced by penetration of bomb fragments and those due to the expansion of air produced by the explosion. A foreign body should be removed only when it was producing severe reaction, such as pain and persistent discharge. Removal should be done by the radical mastoid operation as conservatively as possible. The majority of ear injuries treated at Barcelona were caused by blast: one hundred and seventy-five against thirty-three by bomb fragments. The majority of the injuries caused by blast occurred in the street, as walls of buildings gave protection. Rupture of the tympanic membrane was accompanied by sharp pain, bleeding from the ear and tinnitus. If the patient was seen during the short period of bleeding, drainage should be assisted by placing him on the appropriate side. The practice of placing a pipe or pencil between the teeth when a bomb was expected to fall was found to diminish the incidence of tympanic injuries. The ear protector which gave the best results was a plug with a valve that remained open save when the external pressure was increased.

Mr. V. E. Negus said that of six hundred and twenty-two civilian air raid casualties one hundred and ninety-nine were injuries of the head and neck, and of these one hundred and twenty-nine were craniocerebral. The ear cases numbered twenty-four (3.8 per cent). In military casualties the percentage was 2. The majority of the ear injuries were rupture of the tympanic membrane. Practically all the ear injuries were associated with others, and the majority were due to blast. No patient complained to any extent of tinnitus or vertigo, and routine examination was required to discover some of the ruptures. The examination was made in view of the serious effects that might follow infection of the ear. For cleansing the external meatus he preferred a mercury preparation which left the ear dry, moisture being liable to precipitate infection. Any cerumen should be carefully removed, but the deeper parts of the meatus should be left severely alone. He protested against the practice of pushing wicks of gauze or other material into the ear. At one time the case for immediate operation in wounds of the mastoid process might have been arguable, but the introduction of chemotherapy pointed to the wisdom of delayed operation. Any fragments of loose bone or metal should be removed at the time, but nothing in the way of extensive operation should be done.

The Native Physician in the British Western Pacific

The *Native Medical Practitioner*, which is the journal of the Central Medical School, Suva, shows the progress which has been made in educating the natives of the Pacific in modern medicine. The students are drawn from the islands of the British Western Pacific, New Hebrides, Tonga, New Zealand dependencies and American Samoa. The course takes four years and the graduates are termed "native medical practitioners." They are under the control of the medical authorities of the various islands. In a foreword to the journal Sir Harry Luke, governor of Fiji and high commissioner for the Western Pacific, pays a tribute to the work of Dr. S. L. Lambert and the Rockefeller Foundation. The graduation ceremony of the

year is described by a Fijian student. The Hippocratic Oath is administered in the presence of a representative gathering of officials and the public. The governor stated that he had observed with satisfaction the patience and skill of the native medical physicians. The articles in the journal show how well modern teaching has taken root in this remote part of the world. A nurse, who gained second place in the British Empire Baby Week Campaign, describes how child welfare work is actively carried on in Fiji. Routine medical inspection and advice to parents on the lines of modern teaching are described. An article on his surgical experiences by a native graduate shows sound surgical instruction. The high proficiency of the native students in anatomy is borne out by medical visitors to the school. The lecturer on dentistry describes the superiority of the native teeth to those of Europeans. The superiority of the native teeth is ascribed to diet, and the cases of caries are deemed to be caused by the eating of white bread. Tuberculosis in Fiji is dealt with by Dr. McGusty, director of medical services. The disease is on the wane but is still a serious problem.

BUENOS AIRES

(From Our Regular Correspondent)

Nov. 8, 1940.

Health Regulations Governing Airships

According to new health regulations adopted by the government for commercial airships plying between foreign countries and Argentina, pilots must keep official records of the crew, passengers, merchandise, mail, landing stations en route, the occurrence of illness and so on. The record must show the visé of the Argentine consulate at the point of departure. There are also control regulations for the vaccination of the personnel.

Health Service by Airship

By order of the Argentine government, a health service by airship has been inaugurated. It has exclusive use of three airships, with the same number of airports situated in the large Chaco region. The control of this service is divided between the national public health department in medical matters and the general office of civil aeronautics in matters of technical operation. When officially used, this service meets sanitary or prophylactic needs affecting public emergencies or makes possible medical aid for indigent persons. For this service there are no charges. The service may also be engaged on a private basis for ambulance purposes. Payment for this is at the rate of 50 centavos (14 to 15 cents) per kilometer. Until special funds enabling a special personnel are available, the requisite crews are furnished by the joint managements.

Congress on Endocrinology

The second Pan American Congress for Endocrinology will meet in Montevideo, Uruguay, March 5-8, 1941. Among others, papers will be read by F. C. Koch, Chicago; H. M. Evans, California; B. A. Houssay, Buenos Aires, on the regulation of the endocrine functions of the pancreas; A. Lipschuetz, Santiago de Chile, on endocrine foundations in tumors of epithelial and mucosal origin in the female genital sphere; M. R. Castex and associates, Buenos Aires, on endocrine therapy in genital dysfunction; J. C. Mussio Fournier, c. s., Montevideo, on the cardiovascular apparatus in thyroid gland insufficiency; E. Mira y López, Habana, on instantaneous perception of endocrine psychoses; A. Peralta Ramos, Buenos Aires, on endocrine correlation in disturbances of the genital cycle; L. Fraenkel, c. s., Montevideo, on mammary glands and endocrine glands: neurohumoral relations.

Dr. Pedro A. Barcia, Casilla de Correo 255, Montevideo, Uruguay, will furnish further information on request.

The meetings of the second Brazilian Congress for Urology were set for November 9-16 in Rio de Janeiro and São Paulo.

First Argentine Congress for Puericulture

The first national congress for puericulture met October 7-12 in Buenos Aires under the presidency of Dr. Alfredo Buzzo, professor of toxicology in the medical faculty of Buenos Aires and a pediatrician. The chairman pointed out that ignorance and poverty were the two chief factors that caused untold misery to mothers and children. Maternal care and child care have been under legal control since 1936 (THE JOURNAL, April 27, 1940, p. 1684). He discussed nutrition, the norms for weaning, the use of biometry, the study of the preschool child and related topics. An exhibit of numerous charts showed the progress made by public and private institutions for infants and preschool children, as well as that of medicosocial welfare in Argentina.

The first of the leading subjects was the control of tuberculosis (Prof. Pedro de Elizalde). A number of papers were read dealing with the results of BCG vaccination. One of the papers on tuberculosis was by S. R. Rosenthal, Cook County Hospital, Chicago. The third leading subject dealt with growth and physical development. Prof. Pedro Escudero called attention to the fact that the potentialities, rhythm and character of physical development depended on nutrition. He discussed the factors which affected the normal development of the child during the first three years, such as heredity, diseases of parents, the care and nutrition of pregnant women and the care of the newborn. Other leading subjects were rickets, treated by Prof. Juan P. Garrahan and Felipe González Alvarez, and prevention of syphilis, discussed by Prof. Raúl Cibils Aguirre and Benito Soria.

The government was requested to create a special committee which is to give its cooperation to agencies working for the protection and medicosocial welfare of children. The government was requested to provide funds for the control of tuberculosis throughout the country. Organizations concerned with child protection are to interest themselves in the treatment of syphilitic fathers. The law requiring premarital examinations of men should be applied also to women. The physical and mental development of preschool children, especially among the underpriviliged, should be supervised and kindergartens and schools for mothers established. Special courses for the training of teachers of abnormal children should be established by the department of justice and public instruction. The preparation of a health manual is desirable and should be used in all institutions connected with child welfare work.

In connection with the meeting of the congress, the National Institute for Nutrition, under the direction of Professor Escudero, released three pamphlets intended for the public. The first of these gave an insight into the work done by the institute, the second dealt with the problems of nutrition during pregnancy and the third discussed nutrition during the early years.

The next congress will meet in Córdoba in 1942.

Marriages

ROBERT BRUCE MILLER to Miss Verna Anderson, both of Lebanon, Ore., in Albany in September 1940.

ROLAND E. NIEMAN, Cincinnati, to Miss Cynthia Hampton of Hamilton, Aug. 30, 1940.

HARRY SACKS, Washington, D. C., to Miss Isabell Boaz of Atlanta, Ga., Nov. 20, 1940.

AMBROSE J. HERTZOG to Miss Irma Behrens, both of Eau Claire, Wis., Oct. 11, 1940.

AUGUST C. PAVLOTOS, Lancaster, Pa., to Miss Grace Kusupolos in October 1940.

ERVIN T. RECHLICZ, Milltown, Wis., to Miss Doris Sylling of Amery, Sept. 24, 1940.

CLARENCE A. VOGEL to Miss Ada E. Smith, both of Elroy, Wis., Sept. 14, 1940.

Deaths

Roger Brooke ● Assistant Surgeon General, Medical Corps, United States Army, with rank of Brigadier General, and Commanding Officer, Field Service School at Carlisle Barracks, Pa.; Baltimore Medical College, 1900; commissioned in the United States Army in 1901; was chief of the medical service of the Letterman General Hospital, San Francisco, from 1911 to 1915 and from August 1935 to April 1940; senior instructor in the medical officers training corps at Fort Oglethorpe, Ga., 1917-1918; chief of the section on tuberculosis in 1919 and chief of the division of medicine, Surgeon General's Office, War Department, 1920-1921; chief consultant, division of medicine, Veterans Bureau, Washington, D. C., in 1923; promoted to lieutenant colonel in 1917, colonel in 1927 and brigadier general in 1938; awarded the Distinguished Service Medal for services during the World War; fellow of the American College of Surgeons and the American College of Physicians; in 1938 member of the House of Delegates of the American Medical Association; aged 62; died, Dec. 18, 1940, in the Walter Reed General Hospital, Washington, D. C., of arteriosclerosis.

John Shelton Horsley Jr. ● Richmond, Va.; Harvard Medical School, Boston, 1922; member of the Southern Surgical Association; member and secretary, 1927-1928, of the Southern Society of Clinical Surgeons; associate professor of surgery at the Medical College of Virginia; on the staffs of the Medical College of Virginia hospitals, St. Elizabeth's Hospital, Sheltering Arms Hospital, Crippled Children's Hospital and the Retreat for the Sick; co-author of "Diagnosis of Diseases of the Stomach and Duodenum" and "Operative Surgery," fourth edition published in 1937; aged 40; was killed, Nov. 22, 1940, in an automobile accident.

Ernest Amory Codman ● Boston; Harvard Medical School, Boston, 1895; member of the American Surgical Association, American Association for the Surgery of Trauma, Society of Clinical Surgery and the New England Surgical Society; fellow of the American College of Surgeons; at various times assistant in surgery, assistant in clinical and operative surgery, and lecturer in surgery at his alma mater; consulting surgeon to the Massachusetts General Hospital; author of "The Shoulder"; aged 70; died, Nov. 23, 1940, in Ponkapog, Mass.

Alfred George Long ● Indianapolis; Manitoba Medical College, Winnipeg, Canada, 1908; director of the laboratory of hygiene, state board of health, from June 1922 to June 1924; formerly assistant professor of bacteriology and pathology and acting director and director of the public health laboratories, University of North Dakota School of Medicine, Grand Forks; aged 54; died, Nov. 20, 1940, of carbon monoxide poisoning.

Robert Baylor Shackelford ● Lieutenant Colonel, United States Army, retired, Cismont, Va.; University of Virginia Department of Medicine, Charlottesville, 1909; served during the World War; was commissioned a major in the medical corps of the United States Army in 1920 and was retired with rank of lieutenant colonel in 1931 for disability in line of duty; aged 59; died in November 1940 at West Point, N. Y.

Lewis Morris ● Medical Director with rank of Captain, U. S. Navy, retired, Whitefield, N. H.; University of Maryland School of Medicine, Baltimore, 1890; entered the navy in 1891 and retired in 1920 for incapacity resulting from an incident of service; served during the Spanish-American and World wars; aged 73; died, Nov. 15, 1940, in the Knickerbocker Hospital, New York, of chronic nephritis and uremia.

John Willis Martin ● Annapolis, Md.; University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, 1917; fellow of the American College of Surgeons; served during the World War; on the staff of the Emergency Hospital; aged 44; died, Nov. 5, 1940, in Eastport of a brain tumor.

John Crandall Lindsay ● Cheshire, Conn.; Harvard Medical School, Boston, 1910; member of the American Psychiatric Association and the New England Society of Psychiatry; medical director of the Connecticut Reformatory; aged 57; died, Nov. 16, 1940, in the New Haven (Conn.) Hospital of chronic duodenal ulcer.

Frederick Ammi Mead, Willimansett, Mass.; Albany (N. Y.) Medical College, 1892; member of the Massachusetts Medical Society; served during the World War; for many years member of the board of health of Chicopee; aged 71; died, Nov. 14, 1940, in Chelsea.

Ernest H. McDede, Lyndhurst, N. J.; College of Physicians and Surgeons, Baltimore, 1910; member of the Medical Society of New Jersey; formerly member of the board of health and board of education; for many years on the staff of the West Hudson Hospital, Kearney; aged 60; died, Nov. 3, 1940.

John Cotton Maynard, Toronto, Ont., Canada; University of Toronto Faculty of Medicine, 1914; served during the World War; attending physician to the Home for Incurable Children; member of the board of governors of the Trinity College School, Port Hope; aged 48; died, Nov. 7, 1940.

Dean Loller Rider ● Riverside, Ill.; Rush Medical College, Chicago, 1923; clinical assistant in surgery at his alma mater from 1923 to 1928 and clinical associate from 1928 to 1937; formerly on the staffs of the Provident and Cook County hospitals; aged 42; died, Nov. 15, 1940.

Frank M. Lander, Williamston, S. C.; Medical College of the State of South Carolina, Charleston, 1900; member of the South Carolina Medical Association; formerly member of the state board of medical examiners; aged 67; died, Nov. 3, 1940, in Anderson.

Alexander Eustace Muse, Baltimore; Maryland Medical College, Baltimore, 1904; member of the Medical and Chirurgical Faculty of Maryland; also a pharmacist; aged 76; died, Nov. 18, 1940, in St. Agnes' Hospital of carcinoma of the prostate.

Charles Sims Miller, Jackson, La.; Medical Department of Tulane University of Louisiana, New Orleans, 1910; acting superintendent of the East Louisiana State Hospital; aged 54; died, Nov. 7, 1940, in Memphis, Tenn., of coronary thrombosis.

Peter McPartlon, Schenectady, N. Y.; Albany Medical College, 1900; member of the Medical Society of the State of New York; formerly superintendent of the Glenridge Sanatorium; aged 68; died, Nov. 20, 1940, in the Ellis Hospital.

Edward Browning Meigs ● Washington, D. C.; University of Pennsylvania Department of Medicine, Philadelphia, 1904; an Associate Fellow of the American Medical Association; aged 61; died, Nov. 5, 1940, of pulmonary tuberculosis.

Charles Eugene Mayfield, Wanatah, Ind.; Kentucky School of Medicine, Louisville, 1905; member of the Indiana State Medical Association; formerly county coroner; aged 59; died, Nov. 3, 1940, of carcinoma of the prostate.

Henry Thomas Lee, New York; Columbia University College of Physicians and Surgeons, New York, 1898; aged 68; died, Nov. 17, 1940, of injuries received when he fell from an eighth floor window of the Doctors Hospital.

Floyd Britton Langdon, Des Moines; University of Illinois College of Medicine, Chicago, 1915; on the staffs of the Iowa Lutheran, Iowa Methodist and Mercy hospitals; aged 50; died, Nov. 10, 1940, of cerebral hemorrhage.

Henry Isaac Leviton ● Los Angeles; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1909; aged 56; on the staff of the Cedars of Lebanon Hospital, where he died, Nov. 11, 1940.

Moe Jesse Mayer, New York; New York Homeopathic Medical College and Flower Hospital, New York, 1916; aged 49; died, Nov. 7, 1940, in the Beth David Hospital of arteriosclerotic heart disease.

William Edward Owen, Cedar Rapids, Iowa; Rush Medical College, Chicago, 1889; member of the Iowa State Medical Society; aged 78; died, Nov. 9, 1940, of abscess of the liver and bronchopneumonia.

Homer Benjamin Millhon ● Owaneco, Ill.; Northwestern University Medical School, Chicago, 1903; for many years on the staff of St. Vincent's Hospital, Taylorville; aged 70; died, Nov. 2, 1940.

Irving Isaac Littman ● Baltimore; University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, 1928; aged 37; died, Nov. 2, 1940, of cerebral embolism.

Francis Kirsch, East St. Louis, Ill.; Homeopathic Medical College of Missouri, St. Louis, 1890; aged 78; died, Nov. 5, 1940, in St. Mary's Hospital of cerebral hemorrhage.

John Powers, Kansas City, Mo.; Missouri Medical College, St. Louis, 1881; aged 81; died, Nov. 7, 1940, of arteriosclerotic nephritis with uremia.

William John Morrison, Chicago; Chicago Medical School, 1916; aged 59; died, Nov. 13, 1940, of acute myocarditis.

Mark Manley ● Brooklyn; Long Island College Hospital, Brooklyn, 1895; aged 72; died, Nov. 7, 1940.

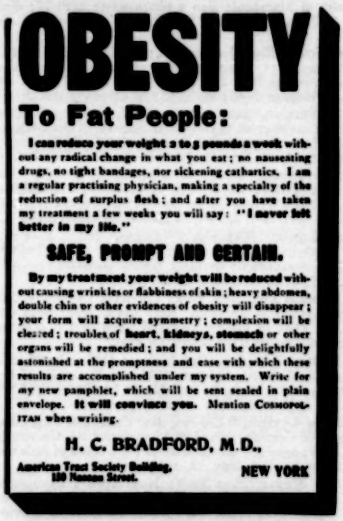
Bureau of Investigation

BRADFORD, BROUGH, DOYLE AND DAVIS

Various Doctors Connected with Promotion of Fraudulent Obesity Cure

The recrudescence of a fake "fat cure" that apparently had been dormant for years is revealed in a Post Office fraud order banning from the mails a Baltimore outfit, The Bradford Laboratories, Marie Cecil, and their officers and agents.

The history of this fraud or its antecedents dates back at least forty years. Records show that H. Clark Bradford, M.D., was advertising his obesity treatment from New York in 1900. Bradford died in 1915 and his business was taken over by one F. Thompson Brough, M.D. For a time Brough called himself "Successor to Dr. H. C. Bradford" and claimed that he was "prescribing by the Bradford Method." In addition to his "obesity cure" business Brough had at different times conducted other quackish activities, numerous and varied.


OBESITY
To Fat People:
I can reduce your weight 2 to 5 pounds a week without any radical change in what you eat; no nauseating drugs, no tight bandages, nor sickening cathartics. I am a regular practising physician, making a specialty of the reduction of surplus flesh; and after you have taken my treatment a few weeks you will say: "I never felt better in my life."
SAFE, PROMPT AND CERTAIN.
By my treatment your weight will be reduced without causing wrinkles or flabbiness of skin; heavy abdomen, double chin or other evidences of obesity will disappear; your form will acquire symmetry; complexion will be cleared; troubles of heart, kidneys, stomach or other organs will be remedied; and you will be delightfully astonished at the promptness and ease with which these results are accomplished under my system. Write for my new pamphlet, which will be sent sealed in plain envelope. It will convince you. Mention COSMOPOLITAN when writing.
H. C. BRADFORD, M.D.,
American Trust Society Building, 130 Nassau Street. NEW YORK

Advertisement of original Bradford concern from the Cosmopolitan, November 1900.

Presumably Bradford's "cure" retained its old composition. When Bradford was putting it out, the American Medical Association's chemists made some tests for thyroid content but found none. The chemists did report that in general the "S. Z. Special Tablets" appeared to contain baking soda, some bismuth salt, perhaps a subnitrate, and some nitrogenous principle, perhaps pancreatin. The "A. R. Special Tablets" appeared to contain baking soda and rhubarb or some similar cathartic. In 1911 the state chemists of North Dakota reported finding that the "A. R. Special Tablets" contained powdered rhubarb, baking soda and oil of peppermint, and the "S. Z. Special Tablets" benzoin, extract of nux vomica, potassium carbonate and a bismuth salt.

In 1930 it was reported that Brough had died from poison, self administered, after having been indicted on a charge of performing an abortion. It was said that he had taken over the "practice" of another physician who had "retired" from the abortion field after having trouble with the authorities.

Whether Brough continued operating the "fat cure" business up to the time of his death in 1930 is not clear. At least it appears that thereafter the project was dormant until 1936, when it was reported that a concern known as the Bradford Laboratories was advertising a reducing method from Baltimore. Its literature claimed that "for over half a century we have been in business" and that "The Bradford Method of Weight Reduction has successfully reduced the weight of many people over a period of fifty years." Included in the advertising was a "treatise" on obesity written by F. Thompson Brough of New York. This literature did not reveal that Brough had been dead since 1930. There was also an "absolute guarantee" issued over the facsimile signature of Frank J. Doyle, M.D., "Medical Director."

In 1938 a physician reported that the Bradford Laboratories, answering an inquiry that he had sent them, replied in part:

"We wish to advise that the same preparations used by Dr. Brough in 1916 are still in use today."

Hence the treatment presumably still contained, among other ingredients, such chemical substances as baking soda, potassium carbonate and a bismuth salt. Yet in a letter sent out in June 1938 to an inquirer the Bradford concern claimed:

"The treatment is composed of a combination of roots and herbs, *no chemical preparations* . . ." (Italics ours.—Ed.)

Although, as previously mentioned, F. Thompson Brough died in 1930, a medical society reported in April 1938 that some one was putting out "F. Thompson Brough's Treatment for Obesity" from Eighth Avenue and Thirty-Fourth Street, New York, an address that Brough had long used in selling his mail order "treatment."

In 1938 the Post Office Department began to look into the Baltimore concern's activities. The information that follows is taken partly from the memorandum on the case by Judge Vincent M. Miles, solicitor for the department, and partly from the files of the Bureau of Investigation of the American Medical Association.

The Post Office investigation revealed that an Elmer L. Kincaid was both president and vice president of the Bradford company; his brother, a Donald Kincaid, was acting manager, secretary and treasurer, and Dr. William A. Davis was "Medical Director," as successor to Dr. Frank J. Doyle, who died in February 1939 and who himself had succeeded Dr. F. Thompson Brough in this position. Also it was found that in spite of the "Laboratories" part of the name the firm did not have equipment for compounding medicines. It was shown that although the advertising advised that an "experienced" physician should be chosen for the treatment of obesity, one of the promoters admitted that both Drs. Doyle and Davis had been employed through advertisements in the local papers and had no special qualifications or experience in treating obesity.

Among the Bradford advertising claims that the Post Office memorandum on the case pointed out as typical were:

> Proven by over fifty years of success.
> Called "The World's Greatest Treatment for Obesity."
> This method is unlike any other.
> The fatty tissues must be gradually dissolved and eliminated from the system . . . our treatment is the one that does it . . . removal of diseased fatty tissue is but one detail of the treatment; it is quite as important that the health should be improved, that the blood and skin be purified, that "crow's feet," wrinkles, etc., be cleared from the skin, that the eyes be given the lustre of true health and that the whole physical and mental system shall be brought to a high standard of health.
> Ladies oftentimes write that they only want a reduction in the sizes of certain parts of the body, while others desire a general reduction in all parts. Our treatment is so regulated that this result is usually readily accomplished.

The Post Office hearing brought out that, though it was claimed that the "remedies" were selected to meet the "specific requirements" of each patient, and though the late Dr. Doyle, when "Medical Director" of the business, had claimed that he carefully examined blanks filled out by customers and prescribed proper treatments on the basis thereof, he nevertheless had admitted that these blanks did not "mean much." Expert medical testimony was presented to show that the so-called "report blank" did not call for sufficient information to enable the Bradford people to prescribe a sure, safe or permanent means of overcoming obesity in the person involved. Dr. Davis, testifying for the company as successor to Dr. Doyle, even admitted that "personal contact" with the patient was necessary in the successful diagnosis of certain conditions such as appendicitis, which, if present in persons taking the Bradford treatment, might cause

grave and even fatal results, and that in diagnosing appendicitis in regular practice he resorted to a blood test, urinary examination and other procedures not included in his Bradford method. While he claimed that the Bradford treatment was not sold in any case in which the patient's blank gave any indication of appendicitis or pregnancy, other evidence showed that patients might not always furnish such indications in filling out the forms.

The treatment was shown to consist of forty-five weekly assortments of stock tablets, and a "massage lotion." There were also a printed "Private Manual of Instructions" and a stereotyped set of further directions. Despite the presale representations that the treatment suited the "specific requirements" of each purchaser, both Dr. Doyle and Mr. Donald Kirkland admitted that all patrons were given *identical* medicines for the first five weeks. In fact, it was shown that the only variation in the preparations furnished to different persons during the entire forty-five week period consisted in the substitution in some cases of a weaker or stronger form of laxative, dependent on the age and the number of bowel movements reported by the customer, and in an occasional increase or decrease in dosage.

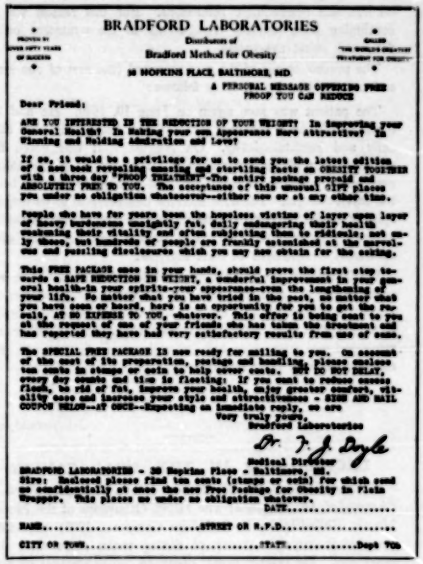
The expert medical testimony also showed that the treatments, somewhat varied from week to week, included fucus and poke root (common ingredients of commercial "obesity cures" but largely discredited for the purpose) as well as ordinary laxatives, purgatives and cathartics, including sodium bicarbonate, jalap, aloes, calomel, croton oil, podophyllum, epsom salt and gamboge. It was pointed out that, although purgatives have for centuries been used for reducing, scientific investigation and accumulated experience have shown that such use is unsuccessful for that purpose and the results are principally harmful.

Further, the expert testimony showed, the Bradford method would not quickly, easily, safely or permanently eliminate obesity regardless of the duration or difficulty of the case, as claimed by the promoters, because experience has shown that treatments of this kind are not a reliable or effective means of overcoming the disturbance of metabolism responsible for that condition; that the excessive loss of fluid with stools that results from the use of these purgatives is quickly restored; that the treatment would not fit every case or remove fat from the breasts, hips, eye sockets, legs or other special parts of the body played up in the advertising; and that, despite the presale representations to the contrary, the patient would be left with wrinkles, crow's feet, "bags" and flabbiness. Neither would the treatment overcome nervousness, appendicitis, eczema, rheumatism, liver, kidney, bladder or heart disorders, apoplexy, arthritis, impure blood or some other conditions, as claimed.

On the contrary, the expert medical testimony showed that harmful results might accrue to a person who took this treatment, depending on the diseases from which he might be suffering, and that some obese persons are tuberculous, in which case the Bradford method might prove particularly harmful in breaking down resistance and thus aggravating the malady. Further, it was shown that the drugs in the Bradford system have a highly irritating effect on the gastrointestinal tract and may cause nausea, acute gastritis, contractive spasm of the gallbladder, enteritis, colitis, rupture of an infected appendix followed by peritonitis, and other serious results. Also it was emphasized that the exercises advocated by the Bradford concern might be dangerous in cases of obesity, complicated heart or kidney diseases, diabetes, thrombosis, phlebitis and other conditions commonly associated with obesity. It even was shown that the Bradford circulars urging the banishing of fat had been sent to persons whose inquiries had indicated the possible presence of pregnancy, ovarian or pituitary dysfunction, cardiovascular-renal failure and other ailments.

Dr. William A. Davis, testifying as "Medical Director" of the Bradford concern, stated that he was a graduate of the University of Maryland Schools of Pharmacy and Medicine "about 1898," served for five years as associate instructor of biology, anatomy and histology in Baltimore Medical College, took postgraduate work in general medicine, including diagnosis in the clinic and dermatology, spent some time at the University of Vienna clinics, and was a deputy health officer in Baltimore and in general practice in that city. Nevertheless, evidence presented showed that, like Dr. Doyle, he had tied up with the Bradford outfit through its advertisements.

In his testimony Dr. Davis admitted that he did not "know much" about metabolism and could not explain the physiologic changes in the body during the process; that he was not qualified as an endocrinologist, could not give the "full gamut" of the endocrine glands or name the chemical substances present in fat, and did not know the basis used in determining a calory. Though he claimed to be an expert on drugs, he failed on cross examination to answer correctly certain questions put to him regarding properties and dosages thereof, and admitted that in his practice he had never used the drugs contained in the Bradford treatment. He further admitted that they constituted an eliminative process (in spite of the disparagement of such a method of reducing in the Bradford literature) and that he was unable to cite any specific authority on obesity which featured the use of alteratives for that condition, having himself, in fact, used alteratives (such as the iodine in fucus) for increasing



BRADFORD LABORATORIES

Discdoers of
Bradford Method for Obesity

38 HOPKINS PLACE, BALTIMORE, MD.

A PERSONAL MESSAGE OFFERING FREE
PROOF TOY CAN REDUCE

Dear Friend:

ARE YOU INTERESTED IN THE REDUCTION OF YOUR WEIGHT? In improving your General Health? In Making your own Appearance More Attractive? In Winning and Holding Admiration and Love?

If so, it could be a privilege for us to send you the latest edition of a new book revealing amazing and startling facts on OBESITY TOGETHER with a three day PROOF TREATMENT--Two entire packages of which are ABSOLUTELY FREE TO YOU. The acceptance of this unusual GIFT places you under no obligation whatsoever--either now or at any other time.

People who have for years been the hopeless victims of layer upon layer of heavy unnecessary unsightly fat, daily endangering their health weakening their vitality and often subjecting them to ridicule; not only those, but hundreds of people are frankly astonished at the marvelous and puzzling disclosures which you may now obtain for the asking.

This FREE PACKAGE once in your hands, should prove the first step towards a RAPID REDUCTION IN WEIGHT, a wonderful improvement in your general health-in your spirits-your appearance-even the lengthening of your life. No matter what you have tried in the past, no matter what you have seen or heard, here is an opportunity for you to get the results, AT NO EXPENSE TO YOU, whatever. This offer is being sent to you at the request of one of your friends who has taken the treatment and has reported they have had very satisfactory results from use of same.

The SPECIAL FREE PACKAGE is now ready for mailing to you. On account of the cost of the preparation, postage and handling, please enclose ten cents in stamps or coin to help cover costs. BUT DO NOT DELAY, every day counts and time is fleeting! If you want to reduce excess flesh, be rid of fat, improve your health, enjoy greater comforts, vitality ease and increase your style and attractiveness - SIGN AND MAIL COUPON BELOW--AT ONCE--Expecting an immediate reply, we are

Very truly yours,
Bradford Laboratories

Dr. J. J. Doyle
Medical Director

BRADFORD LABORATORIES - 38 Hopkins Place - Baltimore, Md.
Gents: Enclosed please find ten cents (stamps or coin) for which send me confidentially and once the new Proof Treat for Obesity in Plain Wrapper. This places me under no obligation whatever.

DATE.....

NAME.....STREET OR R.F.D.....

CITY OR TOWN.....STATE.....Dept 7Th

Form letter (greatly reduced) sent out by the Baltimore Bradford concern.

weight rather than reducing it. He confessed that he was not familiar with the functions of the thyroid gland and that the elimination of fat would not conquer appendicitis, loss of sexual vigor, apoplexy and other conditions as alleged in the Bradford advertising. Altogether Dr. Davis's testimony showed that he was not well informed on the scientific treatment of obesity or on the disturbances of metabolism and glandular functioning which he admitted are responsible therefor.

As the acceptable evidence in the case showed that the business in question was a scheme for obtaining money through the mails by means of false and fraudulent pretenses, representations and promises, a fraud order was issued on Dec. 1, 1939, against the Bradford Laboratories, Marie Cecil and their officers and agents as such, debarring them from further use of the mails.

It may be worth mentioning in this connection that from the Bradford address, 38 Hopkins Place, Baltimore, Marie Cecil also conducted a cosmetic business, chiefly playing up "Solva Roma," an alleged depilatory, but there was also "Clax Pelets (for constipation and excess fat)" which Marie Cecil was advertising in 1928 from New York, where she was then conducting her business. In 1933 it was reported that a New England girl was severely burned after applying Solva-Roma to her face.

Correspondence

BONE MARROW TRANSFUSIONS

To the Editor —In reply to many inquiries concerning the article "Bone Marrow Transfusion," published in the November 16 issue of THE JOURNAL, it would not be amiss to point out that a new method of therapy was presented. Since publication, more than sixty bone marrow transfusions have been done in cases of leukemia, myelogenous and lymphatic, and aplastic anemias. Since the series of cases is so small, conclusions cannot be drawn. However, the results are encouraging in that one noted a definite trend toward improved maturation and delivery of the bone marrow cells with the production of clinical and hematologic remissions. For this reason we are continuing bone marrow transfusions in the treatment of the deficiency blood dyscrasias.

The present status of the case reported (the first of our series and not a selected one) is as follows:

The patient was seen again on June 10, 1940. He had lost much weight on a reducing diet and had been doing well clinically and hematologically. On August 7 it was noted that evidences of a bleeding tendency had developed, e. g. generalized petechiasis, and a large spleen was felt one hand's breadth below the costal margin. The bone marrow had reverted to its original aplastic state. About one week later he died. Permission for autopsy was not obtained. The patient had not been given additional transfusions of bone marrow.

We justifiably felt that the original diagnosis should have been acute leukemic myelosis and not idiopathic aplastic anemia. However, this question is not germane to the discussion. Suffice it to say that a remission had been observed. Whether this remission was normal or induced will remain unanswered until more cases have been studied.

MAURICE MORRISON, M.D.
A. A. SAMWICK, M.D.
Brooklyn.

LACTIC ACID IN THE ORAL CAVITY

To the Editor:—W. D. Miller (*Arch. f. exper. Path. u. Pharmakol.* **16**:291, 1882; The Micro-Organisms of the Human Mouth, Philadelphia, S. S. White Company, 1890) enunciated his chemicoparasitic theory of dental caries more than fifty years ago. He related dental decay to the production of acids resulting from the action of micro-organisms on carbohydrates. One of the acids stressed in this connection was lactic acid.

While Miller and many others have made numerous in vitro experiments showing the production of acids by oral micro-organisms, it is only recently that such in vivo experiments have been performed. Miller and Neuwirth (*Dental Cosmos* **77**:453 [May] 1935) showed that the continual sucking of hard candies resulted in tooth decalcification. They found that the hard candies were composed of practically pure sucrose. They postulated that the tooth decalcification resulted from the action of organic acids on the tooth, the organic acids in turn coming from the action of salivary enzymes and bacteria on the sucrose. (See also in this connection Dental Lesions and Systemic Disease, editorial, THE JOURNAL, July 17, 1937, p. 211.)

Stephan (*J. Am. Dent. A.* **27**:718 [May] 1940) showed a marked fall in the p_H of plaques and open tooth cavities immediately following the rinsing of the mouth with certain carbohydrate solutions. However, Stephan did not indicate what acid or acids are responsible for the fall in p_H noted in his experiments.

Employing the delicate method of Miller and Muntz for the precise determination of ultramicroquantities of lactic acid (*J. Biol. Chem.* **126**:413 [Nov.] 1938), Profs. Isaac Neuwirth and J. A. Klosterman (*Proc. Soc. Exper. Biol. & Med.* **45**:464 [Oct.] 1940) report the rapid production (within ten minutes) of lactic acid in the oral cavity. In their experiments they find a marked increase in the lactic acid content of the oral cavity within ten minutes after the complete solution of tablets of dextrose, sucrose or starch in the mouth. Control experiments by these workers demonstrate that this rapid production of lactic acid in the oral cavity can be ascribed to the activity of oral micro-organisms.

Thus, for the first time there now is not only a demonstration of the production of acids in the oral cavity but also a demonstration of the production of a definite acid—lactic acid.

J. LEWIS BLASS, PH.G., D.D.S.,
New York University College of Dentistry.

A LESSON IN PSYCHOSOMATIC RELATIONSHIPS

To the Editor:—In a recent issue of the *American Journal of the Medical Sciences* (**199**:539 [April] 1940) there is a report by C. H. Brown on the role of foci of infection in the pathogenesis of arthritis entitled "Foci of Infection in Psychiatric Patients." The author compared the incidence of such foci in a group of arthritic patients with the incidence of foci of infection in a group of "healthy" controls. He found that there was no essential difference in the incidence of foci of infection in the two groups and drew the conclusion, therefore, that foci of infection did not constitute a sufficient factor in the pathogenesis of arthritis and that another factor was necessarily involved, such as a constitutional hereditary predisposition to arthritis or a state of allergy to the bacteria in the foci. This conclusion appears valid and logical enough until one considers his so-called "healthy" controls.

I quote from Dr. Brown's paper: "It is the purpose of the present study to determine the incidence of foci of infection in a group of patients who are apparently physically well. The group of patients we selected to study are a group of psychotic patients who were hospitalized because of mental rather than physical sickness. There is no reason to expect in a group of mentally sick, but apparently physically well patients, any difference in incidence of foci of infection than would obtain in a similar economic and geographic group of physically normal human beings." Brown thus bases his selection of cases on a rather crude dualistic conception of mind-body relationship, i. e. disease is either "mental" or "physical." The fallacy arising from such a point of view is interesting.

In a study on the incidence of arthritis in a group of more than 15,000 psychotic patients Gregg (The Paucity of Arthritis Among Psychotic Cases, *Am. J. Psychiat.* **98**:853 [Jan.] 1939) discovered that disabling arthritis occurred seventeen times more frequently in the community at large than among psychotic patients in Massachusetts state hospitals. He presents other data in his paper supporting the general thesis that psychotic patients are strangely immune to arthritis.

It is not my purpose in this communication to discuss the possible reasons for this interesting psychosomatic relationship. It is altogether conceivable, for example, that foci of infection do act as direct, self-sufficient, etiologic agents in the pathogenesis of arthritis but that the psychotic process sets certain other factors into motion which protect the joints from arthritis. Suffice it to say that a group of psychotic patients do not constitute "normal" physical controls.

LOUIS LINN, M.D., Trenton, N. J.

Medical Examinations and Licensure

COMING EXAMINATIONS

NATIONAL BOARD OF MEDICAL EXAMINERS EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in THE JOURNAL, December 28, page 2303.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: Montgomery, June 17-19. Sec., Dr. J. N. Baker, 519 Dexter Ave., Montgomery.

ARIZONA: * Phoenix, Jan. 7. Sec., Dr. J. H. Patterson, 826 Security Bldg., Phoenix.

ARKANSAS: * Eclectic. Little Rock, June 5-6. Sec., Dr. Clarence H. Young, 1415 Main St., Little Rock.

CALIFORNIA: *Oral examination* (required when reciprocity application is based on a state certificate or license issued ten or more years before filing application in California). Los Angeles, Jan 29. *Written.* Los Angeles, Feb. 24-27. Sec., Dr. Charles B. Pinkham, 1020 N St., Sacramento.

COLORADO: * Denver, Jan. 7-10. Applications must be on file not later than Dec. 23. Sec., Dr. Harvey W. Snyder, 831 Republic Bldg., Denver.

CONNECTICUT: * *Medical. Written.* Hartford, March 11-12. *Endorsement.* Hartford, March 25. Sec., Dr. Thomas P. Murdock, 147 W. Main St., Meriden. *Homeopathic.* Derby, March 11-12. Sec., Dr. Joseph H. Evans, 1488 Chapel St., New Haven.

DELAWARE: July 8-10. Sec., Medical Council of Delaware, Dr. Joseph S. McDaniel, 229 S. State St., Dover.

DISTRICT OF COLUMBIA: * Washington, May 12-13. Sec., Commission on Licensure, Dr. George C. Rubland, 203 District Bldg., Washington.

FLORIDA: * Jacksonville, June 23-24. Sec., Dr. William M. Rowlett, Box 786, Tampa.

GEORGIA: Atlanta, June. Sec., State Examining Boards, Mr. R. C. Coleman, 111 State Capitol, Atlanta.

HAWAII: Honolulu, Jan. 8-11. Sec., Dr. James A. Morgan, 48 Young Building, Honolulu.

IDAHO: Boise, April 1. Dir., Bureau of Occupational License, Mr. H. B. Whittlesey, 335 State Capitol Bldg., Boise.

ILLINOIS: *Written.* Chicago, Jan. 21-22. *Reciprocity.* Chicago, Jan. 23. Supt. of Registration, Dept. of Registration and Education, Mr. Lucien A. File, Springfield.

INDIANA: Indianapolis, June 17-19. Sec., Board of Medical Registration and Examination, Dr. J. W. Bowers, Citizens Trust Bldg., Fort Wayne.

MAINE: Portland, March 11-12. Sec., Board of Registration of Medicine, Dr. Adam P. Leighton, 192 State St., Portland.

MASSACHUSETTS: Boston, March 11-13. Sec., Board of Registration in Medicine, Dr. Stephen Rushmore, 413-F State House, Boston.

MICHIGAN: * Ann Arbor and Detroit, June 11-13. Sec., Board of Registration in Medicine, Dr. J. Earl McIntyre, 202-4 Hollister Bldg., Lansing.

MINNESOTA: * Minneapolis, Jan. 21-23. Sec., Dr. Julian F. Du Bois, 350 St. Peter St., St. Paul.

MONTANA: *Reciprocity.* Helena, March 31. *Written.* Helena, April 1. Sec., Dr. S. A. Cooney, 216 Power Block, Helena.

NEVADA: *Reciprocity with oral examination,* Feb. 3. Sec., Dr. Fred M. Anderson, 215 N. Carson St., Carson City.

NEW HAMPSHIRE: Concord, March 13-14. Sec., Board of Registration in Medicine, Dr. T. P. Burroughs, State House, Concord.

NEW JERSEY: Trenton, June 17-18. Sec., Dr. Earl S. Hallinger, 28 W. State St., Trenton.

NEW MEXICO: Santa Fe, April 14-15. Sec., Dr. Le Grand Ward, 135 Sena Plaza, Santa Fe.

NEW YORK: Albany, Buffalo, New York and Syracuse, Jan. 27-30. Chief, Bureau of Professional Examinations, Mr. Herbert J. Hamilton, State Education Department, 315 Education Bldg., Albany.

NORTH DAKOTA: Grand Forks, Jan. 7-10. Sec., Dr. G. M. Williamson, 4½ S. Third St., Grand Forks.

OREGON: * Portland, Jan. 14-16. Exec. Sec., Miss Lorienne M. Conley, 608 Failing Bldg., Portland.

PENNSYLVANIA: Philadelphia, January 7-11. Acting Sec., Bureau of Professional Licensing, Miss Marguerite G. Steiner, 358 Education Bldg., Harrisburg.

SOUTH DAKOTA: * Pierre, Jan. 21-22. Dir., Medical Licensure, Dr. J. F. D. Cook, Pierre.

VERMONT: Burlington, Feb. 11. Sec., Dr. W. Scott Nay, Underhill.

WASHINGTON: * Seattle, Jan. 13-15. Sec., Department of Licenses, Mr. Nelson N. Vaughan, Olympia.

WEST VIRGINIA: Charleston, March 3. Sec., Public Health Council, Dr. Arthur E. McClue, State Capitol, Charleston.

WISCONSIN: * Madison, Jan. 14-16. Applications must be on file not later than Jan. 2. Sec., Dr. H. W. Shutter, 425 E. Wisconsin Ave., Milwaukee.

WYOMING: Cheyenne, Feb. 3-4. Sec., Dr. M. C. Keith, Capitol Bldg., Cheyenne.

* Basic Science Certificate required.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

CONNECTICUT: Feb. 8. Address State Board of Healing Arts, 1945 Yale Station, New Haven.

DISTRICT OF COLUMBIA: Washington, April 21-22. Sec., Commission on Licensure, Dr. George C. Rubland, 203 District Bldg., Washington.

FLORIDA: Dr. Land, June 7. *Applications must be on file not later than May 24.* Sec., Prof. J. F. Conn, John B. Stetson University, De Land.

IOWA: Des Moines, Jan. 14. Dir., Division of Licensure and Registration, Mr. H. W. Grefe, Capitol Bldg., Des Moines.

MICHIGAN: Ann Arbor, Detroit and East Lansing, Feb. 14-15. Sec., Miss Flora E. Dube, East Lansing.

MINNESOTA: Minneapolis, Jan. 7-8. Sec., Dr. J. Charnley McKinley, University of Minnesota, 126 Millard Hall, Minneapolis.

NEBRASKA: Omaha, Jan. 14-15. Dir., Bureau of Examining Boards, Mrs. Clark Perkins, 1009 State Capitol Bldg., Lincoln.

OREGON: Portland, Feb. 15. Sec., State Board of Higher Education, Mr. Charles D. Byrne, University of Oregon, Eugene.

RHODE ISLAND: Providence, Feb. 19. Sec., Division of Examiners, Rev. Nicholas H. Serror, Providence College, Providence.

WASHINGTON: Seattle, Jan. 9-10. Sec., Department of Licenses, Mr. Nelson N. Vaughan, Olympia.

Nevada May Report

Dr. Frederick M. Anderson, secretary, Nevada State Board of Medical Examiners, reports the written examination for medical licensure held at Carson City, May 6, 1940. The examination covered 14 subjects and included 80 questions. An average of 75 per cent was required to pass. Three candidates were examined, all of whom passed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
College of Medical Evangelists		(1940)	84.4
Harvard Medical School		(1934)	87.3
St. Louis University School of Medicine		(1926)	75.7

Five physicians were licensed to practice medicine by reciprocity on May 6 and August 5. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of California Medical School		(1922)	California
University of Colorado School of Medicine		(1938)	Utah
University of Nebraska College of Medicine		(1939)	Nebraska
University of Western Ontario Medical School		(1924)	Ohio
McGill University Faculty of Medicine		(1937)	California

California July Report

Dr. Charles B. Pinkham, secretary, California State Board of Medical Examiners, reports the written examination for medical licensure held at Los Angeles, July 16-18, 1940. The examination covered 9 subjects and included 90 questions. An average of 75 per cent was required to pass. One hundred and twenty-eight candidates were examined, 111 of whom passed and 17 failed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
University of Arkansas School of Medicine		(1938)	75.9
College of Medical Evangelists		(1940)	76.7, 76.7, 77.7, 77.7, 79.1, 79.7, 79.7, 80.3, 80.4, 80.9, 81.3, 81.6, 81.9, 82.6, 83, 83.2, 83.4, 83.7, 83.9, 84.1, 84.2, 84.8, 85, 85.1, 85.3, 85.7, 85.9, 85.9, 85.9, 86.1, 86.2, 86.2, 86.8, 86.8, 87.6, 88.1, 90.8
Stanford University School of Medicine		(1940)	82.6, 86.2, 86.9, 88.6
University of California Medical School		(1940)	81.3, 82.3, 83.6, 85.4, 86.9, 87.1
University of Southern California School of Medicine		(1940)	76.3, 76.7, 77.1, 78.3, 79.1, 79.2, 79.2, 79.4, 80.8, 81, 82.3, 82.6, 82.8, 82.9, 82.9, 83.4, 83.8, 84, 84.8, 85.1, 85.4, 85.4, 86.4, 88.3
Loyola University School of Medicine		(1940)	75.2, 80.9, 82.2
Northwestern University Medical School		(1940)	78.8,* 82.6
The School of Medicine of the Division of the Biological Sciences		(1938)	81.9
University of Illinois College of Medicine		(1940)	86.3
University of Michigan Medical School		(1939)	83.7
Wayne University College of Medicine		(1940)	87.9
University of Minnesota Medical School		(1940)	79.7, 83.1 83.3
St. Louis University School of Medicine		(1940)	83.2
Creighton University School of Medicine		(1939)	83.1
Columbia University College of Physicians and Surgeons		(1939)	84.3
New York Medical College, Flower and Fifth Avenue Hospitals		(1939)	85.4
New York University College of Medicine		(1940)	90.4
Syracuse University College of Medicine		(1940)	79.2
University of Oklahoma School of Medicine		(1939)	86.8
University of Oregon Medical School		(1939)	83.4
Temple University School of Medicine		(1940)	80.7
University of Pennsylvania School of Medicine		(1939)	76.3
University of Texas School of Medicine		(1937)	80.9
Marquette University School of Medicine		(1940)	80
University of Wisconsin Medical School		(1939)	79.2
University of Toronto Faculty of Medicine		(1936)	82.7
McGill University Faculty of Medicine		(1934)	87.7
Leopold-Franzens-Universität Medizinische Fakultät, Innsbruck		(1926)	86.9
Medizinische Fakultät der Universität Wien		(1913) (1920) 79, (1937) 85.2	90.3,
Universita Karlova Fakulta Lékařská, Praha		(1926)	78.9
Université de Paris Faculté de Médecine		(1932)	81
Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin		(1927) 77.8, (1934)	81.7
Johann Wolfgang Goethe-Universität Medizinische Fakultät, Frankfurt-am-Main		(1930)	81
Ludwig-Maximilians-Universität Medizinische Fakultät, München		(1922) 81.4, (1931)	77.8
Rheinische-Friedrich-Wilhelms-Universität Medizinische Fakultät, Bonn		(1918)	75.2

School	FAILED	Year Grad.	Number Failed
College of Medical Evangelists		(1939)	1
Stanford University School of Medicine		(1940)	1
University of California Medical School		(1940)	1
University of Southern California School of Medicine		(1940)	1
Loyola University School of Medicine		(1940)	1
State University of Iowa College of Medicine		(1939)	1
Boston University School of Medicine		(1933)	1
St. Louis University School of Medicine		(1940)	1
McGill University Faculty of Medicine		(1940)	1

Deutsche Universität Medizinische Fakultät, Prag.....(1923)	1
Johann Wolfgang Goethe-Universität Medizinische Fakultät, Frankfurt-am-Main .....(1922)	1
Julius-Maximilians-Universität Medizinische Fakultät, Würzburg .....(1923)	1
Rheinische Friedrich-Wilhelms-Universität Medizinische Fakultät, Bonn .....(1927)	1
Universität Heidelberg Medizinische Fakultät.....(1927)	1
Latvijas Universitäte Medicinas Fakultäte, Riga.....(1928)	1
Uniwersytet Stefana Batorego Wydzial Lekarski, Wilno.(1937)	1
Universitade de Lisboa Faculdade de Medicina.....(1938)	1

* This applicant has received the M.B. degree and will receive the M.D. degree on completion of internship.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Malpractice: Limitation of Actions; Accrual of Right of Action.—The defendant physician performed a surgical operation on the plaintiff's gallbladder in 1923. After the operation and during the period of convalescence he informed the plaintiff that "he had punctured every cell in her gallbladder and that her gallbladder was clean now and that she need not worry any more." Some time thereafter the plaintiff moved to another state and never again consulted the defendant. In October 1937 she consulted other physicians who discovered, by means of roentgenograms, that a gauze sponge had been left in her body. In 1938, within one year after the discovery of the sponge, she brought suit against the defendant for malpractice. She alleged that the defendant's failure to remove the sponge had caused her gallbladder to become infected, which resulted in many complications, internal ailments and great physical pain and disability, necessitating expensive medical and hospital care. From a judgment in favor of the physician the plaintiff appealed to the Supreme Court of Alabama.

The Alabama statute of limitations in tort cases is one year and in contract cases six years. The defendant contended that the plaintiff's action was barred by the statute of limitations, since it was not brought until fifteen years after the operation. The plaintiff, however, claimed that the operation fifteen years before had never been completed because a foreign substance, which the defendant was under obligation to discover and remove, had been left in her body. She contended, therefore, that the statute of limitations did not begin to run until that foreign substance was discovered, and so her suit was not barred, since she had instituted it within one year after discovery. But, said the Supreme Court, the decisions are practically unanimous in holding that, in the absence of a fraudulent concealment, the statute of limitations begins to run when the relation of physician and patient ends with reference to the ailment treated. It is true that when confidential relations exist, as between a physician and his patient, the duty to disclose may render silence fraudulent, but knowledge of the facts is a necessary element of fraudulent concealment. In the present case, although the plaintiff alleged that the defendant, in informing her that "her gallbladder was clean now," had made a misrepresentation of fact when he either knew that his statement was false or did not know that it was true, at no time did she allege or prove that he knew that he had left the sponge in her body. In fact, whether the statement credited to the defendant was more than merely a reassuring professional opinion, and understood as such, is questionable. The court was of the opinion that, in the absence of proof of actual knowledge on the part of the defendant that he had left the sponge in the operative wound, there was no fraudulent concealment. Since the plaintiff did not return to the defendant for further treatment after she left the state, the defendant was not responsible for the failure of other physicians to utilize the roentgen ray more promptly to discover the presence of the foreign substance in her body. Certainly, what the defendant said to the plaintiff at the time of the operation did not in any way prevent or delay the discovery of the sponge by other physicians, since there was no evidence that they relied on the defendant's statement. Accordingly, the Supreme Court held that the action was barred by the statute of limitations and so affirmed judgment in favor of defendant.—*Hudson v. Moore, 194 So. 147 (Ala. 1940).*

Hospitals: Liability for Death of Patient Allegedly Due to Exposure to Draft.—In January 1937 the automobile in which the plaintiff's son was riding struck a telephone pole and plunged into a lake. He was removed from the ice-cold water and rushed to the defendant clinic. When he arrived at the clinic he was unconscious, cold and in a severe state of shock. Emergency treatment was provided on a sunporch and an attendant then moved him into a room and placed him on a cot directly between an open window and the door in such a position that a continual draft blew over him. He was not kept well covered and only one small hot water bottle was placed at his feet. A physician ordered a pneumonia jacket placed on him but the nurse failed to do so. Before he died he vomited such a large quantity of muddy water that it overflowed an emesis basin and wetted the bed clothes, which were not changed. He died two days after admission to the clinic. According to the death certificate, the cause of death was "Pulmonary edema and circulatory failure due to injury and inhalation of muddy water into lungs." The plaintiff, individually and as administratrix of her son's estate, sued the defendant clinic to recover damages for the death of her son, which she alleged had been caused by the negligent treatment rendered. The defendant's evidence tended to show that the care and treatment furnished by its staff was in accordance with approved methods. The trial court granted the defendant's motion for judgment notwithstanding the verdict for the plaintiff and dismissed the suit. The plaintiff then appealed to the Supreme Court of Washington.

The plaintiff contended that the defendant was negligent in placing her son, only partially covered, on a cot in front of an open window so that he caught pneumonia and that that was the real cause of his death. But, as the Supreme Court pointed out, the question for determination was whether or not the most probable cause of death was the defendant's failure properly to treat the deceased. It is a well settled rule of law, said the court, that where the evidence goes no further than to show that death may have resulted from one of several causes for which there is liability and from another or other causes as to which there is no liability, then the jury cannot speculate or conjecture between the several causes and return a verdict based on a cause for which there is liability. In view of the "desperate state" of the deceased when he was taken to the clinic, the court believed that it was impossible for reasonable minds to conclude that it was more probable that he died as the result of the defendant's treatment than from the lengthy exposure in freezing water following the accident, or to conclude that there was a greater probability that death would not have resulted but for the lack of proper treatment. The judgment for the defendant was therefore affirmed.—*Nelson v. Columbia Clinic, Inc., 96 P. (2d) 575 (Wash. 1940).*

Society Proceedings

COMING MEETINGS

Annual Congress on Industrial Health, Chicago, Jan. 13-15. Dr. Carl M. Peterson, 535 N. Dearborn St., Chicago, Secretary.

Annual Congress on Medical Education and Licensure, Chicago, Feb. 17-18. Dr. W. D. Cutter, 535 North Dearborn St., Chicago, Secretary.

American Orthopsychiatric Association, New York, Feb. 20-22. Dr. Noyelle C. La Mar, 149 East 73d Street, New York, Secretary.

Central Surgical Association, Ann Arbor, Mich., Feb. 28-March 1. Dr. George M. Curtis, Ohio State University, Columbus, Ohio, Secretary.

Eastern Section, American Laryngological, Rhinological and Otological Society, Philadelphia, Jan. 10. Dr. N. S. Weinberger, Robert Packer Hospital, Sayre, Pa., Chairman.

Middle Section, American Laryngological, Rhinological and Otological Society, Chicago, Jan. 27. Dr. Walter H. Theobald, 307 North Michigan Blvd., Chicago, Chairman.

Pacific Coast Surgical Association, Los Angeles, Feb. 19-22. Dr. H. Glenn Bell, University of California Hospital, San Francisco, Secretary.

Society of Surgeons of New Jersey, Newark, Jan. 29. Dr. Walter E. Mount, 21 Plymouth St., Montclair, Secretary.

Society of University Surgeons, St. Louis, Feb. 14-15. Dr. Frank Glenn, 525 East 68th St., New York, Secretary.

Southern Section, American Laryngological, Rhinological and Otological Society, Nashville, Tenn., Jan. 8. Dr. William G. Kennon, Doctors Bldg., Nashville, Tenn., Chairman.

Western Section, American Laryngological, Rhinological and Otological Society, San Francisco, Feb. 1-2. Dr. Robert C. Martin, 384 Post St., San Francisco, Chairman.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1930 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Ophthalmology, St. Louis

23:1199-1310 (Nov.) 1940

Pharmacologic Behavior of Intra-Ocular Muscles: I. Problem of Sensitization and Methods for Its Study. E. Sachs and P. Heath, Detroit.—p. 1199.

Passage of Horse Serum from Blood Stream into Aqueous Humor of Normal and Immunized Animals. L. Guy, New York.—p. 1209.

Cultivation of Conjunctivitis-Producing and Keratitis-Producing Agents on Chorioallantoic Membrane of Chick Embryo. P. Thygeson, New York.—p. 1217.

Glass Membranes in Eye: Part I. Bowman's Membrane, Descemet's Membrane and Lens Capsule. A. Loewenstein, Glasgow, Scotland.—p. 1229.

Practical Skiascopy. E. Jackson, Denver.—p. 1239.

General Hypertension and Peripheral Optic Pathways. J. Igersheimer, Istanbul, Turkey.—p. 1243.

Subjective "Lightning Flashes." R. F. Moore, London, England.—p. 1255.

Selection of Test Object in Perimetry. O. P. Bourbon, Los Angeles.—p. 1260.

American Journal of Surgery, New York

38:225-446 (Nov.) 1940. Partial Index

Trigeminal Neuralgia with Demonstrable Gross Causative Lesions: Report of Five Cases. R. B. Raney and A. A. Raney, Los Angeles.—p. 227.

Epiphysial Changes Resulting from Acute Infections of Bone. H. B. Macey, Rochester, Minn.—p. 239.

Ureterocele: Treatment by Transurethral Resection. P. S. Adams, Omaha.—p. 249.

Treatment of Furuncles, Carbuncles and Abscesses of Staphylococcic Origin with Thiazole Derivatives of Sulfanilamide. C. A. Beling, South Orange, N. J., and A. R. Abel, East Orange, N. J.—p. 258.

Failures in Rhinoplastic Surgery: Causes and Prevention. J. Safian, New York.—p. 274.

Resection Operation for Total Removal of Cataract: Report of 228 Consecutive Cases. M. J. Blaess, Detroit.—p. 288.

Postoperative Pulmonary Complications: Analysis of Etiology, Diagnosis, Prophylaxis and Treatment. E. J. Gordon, Washington, D. C.—p. 294.

Immediate Restoration of Active Extension of Knee Following Flexion Deformities. R. L. Preston, New York.—p. 303.

Unexpected Occurrence of Sugar in Urine Following Glucose Infusions. R. A. Cutting, Washington, D. C.—p. 306.

Practical Application of the Falling Drop Method for Determining Surgical Prognosis: Preliminary Report. M. N. Foote and G. R. Gerst, Brooklyn.—p. 316.

New Treatment for Sloughing Wounds: Preliminary Report. S. T. Glauser, New York.—p. 320.

Causes for Failure in Thoracoplasty. F. Bortone, Jersey City, N. J.—p. 327.

Rare Malformation of Arm: Double Humerus with Three Hands and Sixteen Fingers. H. C. Stein and E. H. Bettmann, White Plains, N. Y.—p. 336.

Bilateral Complete Syndactylism of All Fingers. S. L. Haas, San Francisco.—p. 363.

Sulfanilamide Derivatives for Furuncles, Carbuncles and Abscesses.—Beling and Abel used sulfamethylthiazole in and sulfathiazole in 15 consecutive cases of staphylococcic infections; 13 of the cases were carbuncles, 12 furuncles and 2 abscesses. Staphylococci were cultured from the lesions of each patient and were recovered from the blood stream of 1. Thirty-eight of the patients were definitely improved after receiving a considerable quantity of the drug; 1 result was questionable because of the prolonged course of the disease and concomitant administration of staphylococcus vaccine. Furuncles were affected most readily and disappeared within four days, except in 2 instances; 1 had about ten furuncles and responded satisfactorily although eight days elapsed before the last one disappeared and the other patient, the one who had received the vaccine, was not definitely improved. Response to thiazole therapy depends in part on the developmental stage of the lesion when the drug is commenced. The earlier furuncles responded about 25 per cent more slowly than well developed lesions but receded without formation of pus. The latter quickly soften, discharge their contents promptly and heal. No core forms and the discharge is liquid. The induration and redness around the lesion disappear rapidly. Carbuncles responded more slowly because of the extensive nature of the lesion but did so with relative rapidity and in essentially the same manner. The surrounding infiltrated areas became soft and the redness disappeared, while the drainage assumed the character described for furuncles. Any cores formed prior to treatment were soft and easily dislodged. Diabetes mellitus is not a contraindication to treatment. It may prolong the time required for the lesion to improve, but this is not always true as the carbuncle of one such patient responded in six days. If it is deemed necessary to excise a carbuncle, the authors advise giving sulfathiazole for twenty-four hours prior to excision, as they believe that this will tend to prevent spread of infection, the development of septicemia and residual local infection. Abscesses usually responded to treatment in from five to eight days, depending on their stage before treatment and on the presence of cellulitis. The authors state that, if staphylococcic cellulitis is treated before there is any tendency to localization, resolution may take place without formation of pus. If pus does form, the abscess will be insignificant. When an abscess has already begun to form, the time taken to clear up the cellulitis and the abscess together is usually several days longer. One case with cellulitis and abscesses cleared in twelve days, 1 with multiple intractable abscesses throughout both breasts cleared up within five days and in another case there was no effect from sulfamethylthiazole. In the last mentioned case there were honeycombed abscesses throughout the scalp and subaponeurotic region following an injury to the scalp and extensive cellulitis; also diabetes was present. Chemotherapy alone is not sufficient treatment for abscesses or any other collection of pus that is accessible. These various lesions should be handled in the customary manner with the addition of thiazole medication by a suitable route.

Double Humerus with Three Hands and Sixteen Fingers.—Stein and Bettmann observed a woman of 52 presenting a normal left arm, and a right arm double average size and terminating in three hands with sixteen fingers of more or less normal appearance. The fact that the patient manifested no other abnormalities or defects and that none have been discovered in her family apparently excludes an endogenous (hereditary) factor. Some type of damage originating from without during gestation is a more probable cause. The authors attempt to explain the anomaly as follows: Nonspecific irritation may have occurred at a period of gestation when the right shoulder and arm were being formed but were not completely differentiated. Possibly an excessive amount of building material was present, and when the rate of growth was accelerated to make up for the harm done a double humerus and plural hands resulted. Some form of injury is thus the most probable explanation. The irritating mechanism could have been abnormally increased intra-abdominal pressure in pregnancy causing adhesions between the amnion and an extremity of the embryo; disease of the amnion or of the uterine mucosa; physical or mental trauma, infectious and toxic influences, maternal genital disease and the like, and alteration in milieu as demonstrated by various animal experimenters. The authors believe that, whatever pathogenic factor is postulated, the spina bifida of the fifth cervical vertebra was presumably the result of an insufficient vertebral segment or a secondary injury to the area of the somites. They believe that the causative injury took place early in embryonic life, probably in the third or fourth week. Fracture of the scapula-arm-hand blastema in the third or fourth week may have caused a process of degeneration, followed perhaps by a process of super-regeneration with rearrangement of the skeleton. Perhaps as a result of this rearrangement the additional ulna materialized and the olecranon was rotated in the ventral plane. The patient feels in no way inhibited by her deformity (except for her shyness). She has been a telephone operator and file clerk for twenty-five years with little inconvenience. She has refused any attempts at correction.

Bilateral Complete Syndactylism of All Fingers.—Haas presents complete bilateral syndactylism in a brother and a sister. Their mother had had severe syndactylism of both hands. These deformities are of congenital origin and represent a regressive atavistic trait. Restoration of six fingers with their corresponding metacarpals was secured on both of the boy's hands. He is able to do many things with either hand that he could not do before operation. The treatment consisted of a series of six plastic operations over a period of nine months. Sufficient time was allowed between the operations to allow the infant to recuperate and also to attain the full effect of each operative procedure. The six fingers are going to remain for about a year, and when it is determined which is least useful it will be sacrificed. Since this paper has been submitted for publication, similar operations have been performed on the sister, restoring five fingers on both hands.

American Review of Tuberculosis, New York

42:551-697 (Nov.) 1940

Tuberculin Reactors and Exposure Cases: Follow-Up Study of Cases Removed from Contact: Inquiry into Endogenous Reinfection. J. A. Johnston, P. J. Howard, F. J. Smith and B. H. Douglas, Detroit.—p. 551.
Immobilization of Lungs Through Pressure: Development of Method of Equalizing Pressure on Both Sides of Chest Wall with Maintenance of Adequate Pulmonary Ventilation. A. L. Barach, with technical assistance of M. Eckman, New York.—p. 586.
*Monaldi's Suction Aspiration of Tuberculous Cavities. E. Kupka and E. S. Bennett, Olive View, Calif.—p. 614.
Bronchial Obstruction and Collapse Therapy. A. H. Aufses, New York.—p. 622.
Thoracoplasty in Fifth and Sixth Decades. R. Shapiro and C. W. Munz, Springfield, Ohio.—p. 631.
Thoracoplasty Following Pneumothorax: Dangers and Results. I. L. Cutler, Rutland, Mass.—p. 640.
Tuberculosis—An Intimate Chronicle. J. A. O'Hale, Brooklyn.—p. 644.
*BCG Vaccine: Its Preparation and Local Reaction to Its Injection. J. D. Aronson, Philadelphia; Erma I. Parr and R. M. Saylor.—p. 651.
Vitamin C in Pulmonary Tuberculosis. A. Kaplan and Marian E. Zonnis, St. Louis.—p. 667.
Vocational Rehabilitation of the Tuberculous: Preliminary Report. Grace H. Carlson and D. H. Dabelstein, Oak Terrace, Minn.—p. 674.

Monaldi's Suction Aspiration of Tuberculous Cavities.—Kupka and Bennett have attempted the puncture of cavities in 22 cases; they failed to locate the cavity with the exploratory needle in 3, and no attempt to introduce the trocar was made. They succeeded in 2 with the needle, but failed to reach the cavity with the trocar, leaving 17 in which the catheter was introduced into the cavity and suction was applied. Ten of these patients are still under suction treatment and therefore only tentative statements can be made. Pleural symphysis was present in 11 patients and pleural space obliteration was produced in 6 by giving one or more autotransfusions. Four had slight hemoptysis at the time of puncture. Four developed mild infection of the thoracic wall; all of these subsided. Two patients died. Among the remaining 15, suction has been discontinued in 5. The cavity has closed and the sputum has become negative for six months in 1. In the second patient the sputum has been converted and the cavity has almost closed, but later serial planigrams showed rapid increase in the size of the cavity necessitating a thoracoplasty. The cavity has closed and the sputum of the third patient has been converted. Now that the cavity is reopening, a thoracoplasty may be done. The patient's condition compared with the critical state at the time of puncture is now fairly good. In the fourth patient the cavity had been reduced to one third of its previous size, when the catheter was accidentally pulled out and could not be replaced. She had had a first stage thoracoplasty a year before and this was followed by a contralateral spread and a downhill course. Now the condition of the opposite lung, as well as her general condition, have so improved during suction aspiration that thoracoplasty can be completed. The fifth patient, with bilateral apical cavities, accidentally extruded her catheter, and puncture will be repeated. She showed no improvement after two months of treatment. Of the 10 patients still under suction treatment, the sputum has been converted in 6, and all but 1 have shown marked diminution in the size of their cavities. In 3 the cavities are so small that planigrams show them barely visible around the tip of the catheter. Of the 4 who still have positive sputum, the cavities of 2 are markedly decreased and the patients so improved that they have become good thoracoplasty risks. The remaining 2 patients had extremely large cavities; both are much improved but their ultimate fate is dubious; there is a possibility that they may yet become thoracoplasty risks. Of the entire series, 5 patients had two cavities at the time the larger one was punctured. The sputums of none of these have been converted, although the cavity secretions of 2 became negative. The authors believe that Monaldi's prolonged suction as an independent procedure under ideal conditions may bring about complete obliteration of cavities, that under less ideal conditions it may serve as a preparatory procedure for thoracoplasty, and that symptomatic relief may be afforded patients with giant cavities causing exhausting cough, choking attacks and severe toxemia. While its final place in therapeusis must await the test of time, the present results are encouraging.

Tuberculosis Protection from BCG Vaccine.—Aronson and his collaborators vaccinated from February 1936 to February 1938 1,565 Indian children from 1 to 19 years of age with BCG vaccine. During the same period 1,460 persons of the same age and sex, living in the same area and under the same conditions, were inoculated with 0.1 cc. of sterile physiologic solution of sodium chloride and served as controls. Before their inclusion in this study both groups failed to react to intracutaneous injection of 0.00002 and 0.005 mg. of purified protein derivative. Roentgenograms of the chests of most members of the two groups were taken either before or shortly after vaccination and at yearly intervals thereafter; also the members of both groups were retested with the same preparation of purified protein derivative. These Indians live under widely different climatic conditions (Arizona, Wyoming, North Dakota, South Dakota and Alaska) and are for the most part indigenous to their present locality. While their physical characteristics, dietary habits and social and economic patterns vary widely, their economic level is almost uniformly low. The BCG vaccine was injected intracutaneously over the deltoid region. It produced no untoward local or general reaction, and no instance of abscess formation or ulceration of the regional lymph nodes was noted. The local tissue response varied in different individuals. The relationship of the character of the local tissue reaction to resistance to tuberculosis is being studied. One year after vaccination, 93.3 per cent of 1,481 persons reacted to the intracutaneous injection of either 0.00002 or 0.005 mg. of purified protein derivative. Two years after vaccination 93.3 per cent of 1,446 persons retested were tuberculin positive and in three years 95.3 per cent of 619 persons reacted positively. The antigenicity appeared to be influenced by the rate of growth of the culture used in preparing the vaccine but not by the age of the culture or the number of generations that the culture had been grown on bile-free medium. Because of the marked variation in the results obtained by different investigators, the authors suggest that the preparation of BCG vaccine and the determination of the resulting allergy be made uniform. The BCG vaccine that they used was prepared in a field laboratory and was used within three days.

Archives of Internal Medicine, Chicago

66:1011-1190 (Nov.) 1940

*Diabetes Mellitus and Syphilis: Study of 258 Cases. L. T. McDaniel, Boston; H. H. Marks, New York, and E. P. Joslin, Boston.—p. 1011.
Electrolyte Balance During Treatment, Crises and Severe Infection in Cases of Addison's Disease: Action of Adrenal Cortical Extracts. J. A. Greene and G. W. Johnston, Iowa City.—p. 1052.
*Anatomic Foundation of Anacidity: Gastroscopic Study. R. Schindler, P. B. Nutter, Chicago; H. E. Groom, Akron, Ohio, and W. L. Palmer, Chicago.—p. 1060.
Influence of Thiamine on Blood Sugar Levels in Diabetic Patients. R. E. Kaufman, New York.—p. 1079.
Relation of Fatty Acids and Bile Salts to Formation of Gallstones. R. E. Dolkart, Boston; Marie Lorenz, K. K. Jones and C. F. G. Brown, Chicago.—p. 1087.
*Syndrome of Subnormal Circulation in Ambulatory Patients. I. Starr and L. Jonas, Philadelphia.—p. 1095.
Syphilis: Review of Recent Literature. C. F. Mohr, P. Padget and J. E. Moore, Baltimore.—p. 1112.

Diabetes Mellitus and Syphilis.—McDaniel and his associates present an analysis of 258 cases of proved diabetes mellitus with syphilis. These patients were encountered among 15,095 diabetic patients, an incidence of 1.7 per cent. Certain specific criteria were fulfilled in each case, and no proof for

the diabetes as being due to the syphilis was found. The chief causes of diabetes (heredity, overweight and age at onset) were the same for diabetic patients with syphilis as for those without syphilis. The authors state that, if "syphilitic diabetes" occurs, theoretically it would most likely be a late manifestation of syphilis in older persons, except in patients with congenital syphilis, in whom diabetes is uncommon. Part of the evidence against the relationship of the two diseases is that of the 258 patients 188 were men and 70 women, a ratio of only 37.2 female to each hundred male patients. This is in great contrast to the ratio in whole series of diabetic patients from 1897 to 1933, in which there were 112.4 female per hundred male patients. This is a good point in indicating that syphilis has little to do with diabetes. Not a single instance of diabetes was cured by optimal antisyphilitic treatment. Usually neither does a patient with syphilis and diabetes have a type of diabetes different from that of the usual patient of the same age. The authors have not been able to recognize the characteristics of such a clinical entity as "syphilitic diabetes."

Anatomic Foundation of Anacidity.—Schindler and his co-workers made a gastroscopic study of 120 patients with histamine-proved anacidity; in 19 of these the anacidity was produced artificially. Gastroscopic examination revealed the following: 1. Gross anatomic lesions were present in all except 5 patients; in 1 anatomic changes invisible gastroscopically had to be assumed because of chronic bismuth poisoning and in 4 psychogenic functional anacidity seemed possible but was not proved. 2. Diffuse inflammation was present in 55 patients; 6 presented hypertrophic gastritis, 12 superficial gastritis, 7 superficial gastritis with transition into atrophic gastritis and 30 atrophic gastritis. The diffuse changes were usually located in the body of the stomach. Anacidity appeared to be the result of an inflammatory process. The apparent extent and severity of the process do not necessarily bear a relationship to the anacidity. 3. In 3 members of families in which pernicious anemia occurred, histamine-proved anacidity was associated with severe atrophic gastritis. This weakens the theory of the inborn constitutional character of anacidity, for the anacidity may be attributed to the gastritis. 4. Of 16 patients with pernicious anemia and anacidity, superficial gastritis or superficial plus atrophic gastritis was seen in 2, patchy or complete atrophic gastritis in 12 and the gastric mucosa appeared normal after liver therapy in only 2. 5. The observations in 23 patients with malignant gastric tumor and histamine-proved anacidity were in accord with the concept that atrophic gastritis plus anacidity may precede gastric carcinoma and that in many cases severe atrophic gastritis may be responsible for the anacidity. Gastroscopic examination of 3 patients failed to reveal pathologic changes in the gastric mucosa. 6. Eight patients with anacidity following a gastric operation had severe diffuse gastritis. No diffuse gastritis and no anacidity were found in 2 before operation, whereas after operation severe purulent acute gastritis and later chronic gastritis with anacidity developed. It seems that the anacidity following gastric operation may be due not only to the reflux of intestinal contents but also to postoperative gastritis. 7. Definite diffuse inflammatory changes were usually found in 11 patients having histamine-proved anacidity after roentgen irradiation. This ranged from mild transient superficial to constant atrophic gastritis. However, at two observations an apparently normal gastric mucosa was seen. This proves that mild organic lesions of the gastric mucosa, producing anacidity, may be present without showing pathologic changes gastroscopically.

Subnormal Circulation in Ambulatory Patients.—Starr and Jonas describe the signs and symptoms found in 100 ambulatory hospital patients who had subnormal basal or resting circulations estimated by their cardiac output. The syndrome is sufficiently definite to permit its diagnosis when methods of estimating cardiac output are not available. Forty-two of the patients were men and 58 women. The ages ranged between 50 and 59 years, but the incidence spread throughout adult life. When multiple diagnoses were possible the case was classified under the most important heading concerning circulation. Thus a case of diabetes with hypertension was classified only under the latter head; a case of angina pectoris with hypertension as the former. Of 30 patients with primary heart disease 18 had either recovered from cardiac infarcts or suffered from angina pectoris, 5 had rheumatic heart disease, 5 had heart block, 1 a calcified pericardium and 1 congenital heart disease. The next largest group consisted of 28 patients with hypertension, all having a systolic pressure in excess of 170 mm. of mercury, a diastolic pressure of more than 100 mm. or both. In a third group of 19 patients nothing abnormal was found. In 17 of them a diagnosis of functional heart disease or neurocirculatory asthenia was justified and the complaints of 2 were gastrointestinal. Of 11 patients with endocrine diseases 4 had diabetes, 4 had undergone partial thyroidectomies for hyperthyroidism, 2 were adjudged to have pituitary syndromes and 1 was a patient with Addison's disease. Of the remaining 12 patients 5 were elderly persons showing but little arteriosclerosis, 3 were convalescent from pneumonia, typhoid and catarrhal jaundice respectively, 4 each had migraine, malnutrition, postural hypotension or attacks suggesting atypical epilepsy with a cardiac lesion. Almost all (90 per cent) of the patients with subnormal circulation regarded themselves as unduly weak and easily fatigued; extreme weakness was the chief complaint of 17. Dyspnea on exertion was reported by 64 patients, and 19 took no exercise because of angina pectoris or peripheral vascular disease and so could not say whether they had undue dyspnea on exertion. The most characteristic symptom of the group was attacks of dizziness, present in 73 per cent. This occurred when the patients were upright, especially when they had just assumed that position. Light headedness, sometimes as attacks of faintness and sometimes just as "spells," was the major complaint of 26. Fourteen patients were subject to repeated attacks of fainting and 5 others had fainted once or twice. Forty of the patients considered themselves nervous; this was the major complaint of 8. The diagnoses were conversion hysteria, anxiety neurosis, neurasthenia and psychoneurosis. Many patients complained of frequent headaches of slight degree, 7 complained of cold extremities and 3 as suffering unduly from hot or cold weather. Physical examination adds little evidence to support the diagnosis of subnormal circulation, though weak or distant heart sounds in the absence of emphysema may excite suspicion. The pulse rate, the size of the heart and the basal metabolic rate are most frequently in the lower half of the normal range, but in some cases they are definitely subnormal. Ambulatory patients with subnormal circulation are common. The abnormality occurs in about half of the patients with coronary heart disease and less frequently in valvular heart disease. It is common in patients with hypertension whose hearts have not enlarged, in patients with so-called neurocirculatory asthenia, in patients with certain endocrine diseases and in convalescents from severe acute infections.

Archives of Otolaryngology, Chicago

32:831-1006 (Nov.) 1940

Tumors of External Auditory Canal: Report of Eleven Cases. H. E. Mitchell, Cleveland.—p. 831.
Suppuration of Petrous Pyramid. R. L. Moorhead, Brooklyn.—p. 845.
Penetration of Perinasal Tissues by Mercurochrome. A. H. Lawton and E. L. Ross, Chicago.—p. 853.
*Indurative or Myalgic Headache. E. M. Seydell, Wichita, Kan.—p. 860.
Revision of Cerebellopontile Angle Lesion Syndrome, with Analysis of Vestibular Findings in Thirty-Four Cases of Verified Tumor of Cerebellopontile Angle. J. Winston, Philadelphia.—p. 877.
Radiation Therapy for Carcinoma of Larynx: Observations After Twenty Years. S. Salinger, Chicago.—p. 887.
Head Noises: Significance, Measurement and Importance in Diagnosis and Treatment. E. P. Fowler, New York.—p. 903.
Complications of Surgical Treatment of Acute Mastoiditis. G. F. Harkness, Davenport, Iowa.—p. 915.
Operative Treatment of Otosclerosis: Reply to a Recent Criticism. G. E. Shambaugh Jr., Chicago.—p. 927.
Use of Anticoagulants in Cases of Postoperative Thrombosis and Embolism. F. W. Bancroft, New York.—p. 934.
Use of Salt Pork in Cases of Hemorrhage. A. J. Cone, St. Louis.—p. 941.
Purulent Otitis Media, Mastoiditis, Sinus Thrombosis and Suppuration of Petrous Pyramid. S. J. Kopetzky, New York.—p. 962.

Indurative or Myalgic Headache.—Seydell describes indurative or myalgic headache, which he believes is frequently confused with disease of the accessory sinuses, migraine, otitis media and mastoiditis. The pain or headache is caused by myalgia of the neck. There may be spasm of one or more of

the cervical muscles, either with or without the appearance of nodules. The pain in the head results from a nodular or spastic condition of the muscles which occurs almost universally. In the majority of persons it is transient and mild, and little or no complaint is made. However, a patient may be so afflicted as to become a veritable invalid. The cause of the condition has not as yet been definitely established. The author is of the opinion that the following predisposing factors play a part: The patient's history usually presents evidence of vasomotor imbalance, allergy, hypersensitivity, high nervous tension or/and psychoneurosis. It is also probable that many have metabolic or endocrine disturbances, while others suffer from various forms of chronic arthritis. Occupation and environment are important factors; persons obliged to hold their heads in fixed positions for long periods are more subject to the complaint. Myalgia occurs almost exclusively in the postural muscles. The exciting factor for such headaches seems always to be an exposure to cold and drafts. The treatment consists of a definite type of massage and the injection of procaine hydrochloride into the painful areas in the neck.

Canadian Public Health Journal, Toronto

31:457-514 (Oct.) 1940

Public Health: Presidential Address. R. O. Davison, Regina, Sask.—p. 457.
Commercialized Prostitution and Venereal Disease Control. D. H. Williams, Vancouver, B. C.—p. 461.
World Health During 1939. J. J. Heagerty, Ottawa, Ont.—p. 473.
Marriage and Mortality. F. G. Pedley, Montreal.—p. 477.
Mental Hygiene and School Health Work. C. H. Gundry, Vancouver, B. C.—p. 482.

Journal of Lab. and Clinical Medicine, St. Louis

26:287-442 (Nov.) 1940

Tuberculosis—Present and Future. G. B. Webb, Colorado Springs, Colo.—p. 287.
Dissecting Aneurysm of Aorta. A. Levitt, D. S. Levy and J. R. L. Cole, Buffalo.—p. 290.
Note on Saccharomyces Fragilis Jorgensen Associated with Pathologic Conditions in Human Beings. N. C. Laffer, Tucson, Ariz.—p. 294.
Action of Epinephrine Injected into Pericardial Sac. P. Blickensdorfer and J. A. Bone, Chicago.—p. 297.
Torula Infection of Central Nervous System. L. H. Goldberg, Nyack, N. Y.—p. 299.
Cutaneous Hypersensitivity to Iodine. J. L. Jacobs and A. Colmes, Boston.—p. 302.
*Acute Endocarditis Due to Anaerobic Pneumococcus. A. Hollander and Eva Landsberg, Brooklyn.—p. 307.
Qualitative and Quantitative Study of Atmospheric Pollen at Moscow, Idaho. J. B. Daubenmire, Moscow, Idaho.—p. 311.
Intramuscular Administration of Sodium Sulfapyridine. L. T. Hall, E. Thompson and R. J. Wyrens, Omaha.—p. 314.
Giant Cell Tumor of Frontal Bone. J. J. Keegan and C. P. Baker, Omaha.—p. 319.
Theory of Prophyrinogenesis. W. J. Turner, North Little Rock, Ark.—p. 323.
Studies on Intravenous Injection of Colloids: II. Effects of Gum Acacia on Certain Functions of Liver with Notes on Its Effects on Production of Immune Bodies. W. K. Hall, New Orleans; R. B. Gibson and L. A. Weed, Iowa City.—p. 330.
Blood Serum Magnesium in Bronchial Asthma and Its Treatment by Administration of Magnesium Sulfate. V. G. Haury, Philadelphia.—p. 340.
Sodium and Potassium Studies in Persons With and Without Arterial Hypertension. D. W. Bennett, San Francisco.—p. 344.
Effect of Iron on Phosphorus, Calcium and Nitrogen Metabolism. Adelaide P. Baker and W. M. Fowler, Iowa City.—p. 351.
Alteration of Glucose Tolerance in Patients with Disease of Pituitary, Thyroid and Adrenal Glands by Changes of Diet. J. A. Greene and L. W. Swanson, Iowa City.—p. 360.
Comparative Iodine Content of Whole Blood and Serum. K. P. Klassen, Ruth L. Bierbaum and G. M. Curtis, Columbus, Ohio.—p. 365.
Comparative Studies on Absorption of Sulfanilamide. W. J. Siebert and F. Loose, St. Louis.—p. 371.

Acute Endocarditis Due to Anaerobic Pneumococcus.—Hollander and Landsberg report what they believe to be the first instance of the isolation of anaerobic pneumococci from the blood stream during life and also the first case of acute endocarditis caused by this organism. The onset with headache and swelling of the eye and the roentgen evidence of infection in the sinuses indicated that these were the primary foci, although not proved, as positive cultures were not obtained. As soluble sulfapyridine was not available then, intrathecal sulfanilamide was given and maintained at a blood level of 7.6 mg. per hundred cubic centimeters for five days. Concurrently with the intrathecal sulfanilamide, oral sulfapyridine was instituted. After eleven days of treatment, despite a sulfapyridine blood level of 11.1 mg. a positive blood culture was obtained. For the next two days the temperature ranged between 99 and 101 F. After a further rise the intravenous therapy was discontinued. The patient continued to receive orally 60 grains (4 Gm.) of sulfapyridine daily. Nevertheless one week later the blood level was only 3.2 mg., at which time the patient became irrational and delirious. Convulsive seizures occurred, starting on the left side and becoming generalized in a few seconds. The course continued steadily downhill and the patient died. A lumbar puncture shortly before death showed a turbid fluid with innumerable gram-positive diplococci. On culture these organisms proved to be identical with those isolated from the blood. There was no relationship between the cultures and the blood concentration of sulfapyridine. Consent for necropsy was not given. The identity of the anaerobic pneumococcus was established by its solubility in bile, fermentation of inulin and quellung reaction with a homologous immune serum. Mice infected with mucin suspensions of these organisms were not protected by either sulfanilamide or sulfapyridine.

Journal of Nervous and Mental Disease, New York

92:569-708 (Nov.) 1940

Cerebral Arc of Corneal Reflex. A. E. Walker, Chicago.—p. 569.
Constitutional Differences Between Deteriorated and Nondeteriorated Patients with Epilepsy: III. Dactylographic Studies. M. Brown and H. A. Paskind, Chicago.—p. 579.
Note on Imagination and Its Exploitation: Psalmanazar and Hélène Smith. C. M. Campbell, Boston.—p. 605.
Method for Shortening Duration of Lower Motor Neuron Paralysis by Cholinergic Facilitation. A. Wolf, New York.—p. 614.
Cysticercus Cyst of Fourth Ventricle with Surgical Removal: Case Report. L. J. Adelstein, Los Angeles.—p. 623.
Electric Corpse Changes and Reaction on Peripheral Nerves in Insulin Treated Schizophrenic Patients. M. Kastan, Cincinnati.—p. 630.
Convulsion Seizures Following Eclampsia. H. G. Hadley, Washington, D. C.—p. 638.
Mental and Neurologic Sequelae of Carbon Monoxide Asphyxia in Cases Observed for Fifteen Years. Naomi Raskin and O. C. Mullaney, Boston.—p. 640.

Journal of Neurophysiology, Springfield, Ill.

3:469-552 (Nov.) 1940

Sensory Cortex of Chimpanzee. P. Bailey, J. G. Dusser de Barenne, H. W. Garol and W. S. McCulloch, New Haven, Conn.—p. 469.
Unit for Sensory Reception in Cornea, with Notes on Nerve Impulses from Sclera, Iris and Lens. Sarah S. Tower, Philadelphia.—p. 486.
Learning and Other Functions of Higher Nervous Centers of Sepia. F. K. Sanders and J. Z. Young, Oxford, England.—p. 501.
Conversion of Phasic into Tonic Movements by Pyramid Lesions. F. A. Mettler and Cecilia C. Mettler, Augusta, Ga.—p. 527.
Forebrain and Rage Reactions. E. A. Spiegel, H. R. Miller and M. J. Oppenheimer, New York.—p. 538.

Laryngoscope, St. Louis

50:921-1024 (Oct.) 1940

Disturbances of Function of Ear After Concussion of Brain. H. Brunner, Chicago.—p. 921.
Panel Discussion: Infectious Lateral Sinus Thrombophlebitis. L. W. Dean, A. F. Hartmann, St. Louis; F. M. Law, New York; A. G. Furstenberg, Ann Arbor, Mich.; H. I. Lillie, Rochester, Minn.; I. Friesner, New York, and H. P. Mosher, Boston.—p. 950.
*Treatment of Sinusitis by Displacement Method: Report of 800 Cases Using Ephedrine, Neosynephrine, Bacterial Antigens and Foreign Proteins. L. K. Gundrum, Los Angeles.—p. 989.
Nystagmus and Eye Deviations in Guinea Pigs with Lesions in Brain Stem. A. R. Buchanan, Denver.—p. 1002.
The "Common Cold" and Common Sense. A. F. Holding, Albany, N. Y.—p. 1012.
Tularemia: Assimilating Symptoms of Acute Ethmoid, Sphenoid Infection. H. M. Goodyear, Cincinnati.—p. 1019.

Displacement Therapy in Sinusitis.—Gundrum states that of the many treatments advocated for sinusitis he has had most success with the displacement treatment suggested by Proetz in 1926. The theory of the treatment is to displace the air in the sinuses and substitute the desired medicament. In the 800 cases in which he has employed such treatment the proportion of improvement with various medicaments was as follows: 2 per cent with foreign proteins, 58 per cent with ephedrine and neosynephrin and 71 per cent with bacterial antigens. Examination and systematic questioning of 100 patients from two to six years after they were discharged revealed that the results were permanent in most cases. Complications have been rare.

Maine Medical Association Journal, Portland

31:291-314 (Nov.) 1940

Safeguarding the Surgeon. H. E. Locke, Augusta.—p. 291.
Pentothal Sodium—Its Field of Usefulness. L. J. Miller and R. M. Tovell, Hartford, Conn.—p. 298.
Disturbed Physiology of Respiration as Criterion in Choice of Anesthesia. M. Saklad, Providence, R. I.—p. 305.

Michigan State Medical Society Journal, Muskegon

39:809-904 (Nov.) 1940

Hypertensive Disease. E. J. Stieglitz, Garrett Park, Md.—p. 827.
Indirect Blood Transfusion: Vacuum and Pressure Method. W. J. Yott, Detroit.—p. 836.
Delivery of After-Coming Head: Modification. J. W. Peelen, Kalamazoo.—p. 838.
Early Carcinoma of Cervix: Diagnosis and Treatment. L. A. Campbell, Saginaw.—p. 839.
Male Hypogenitalism. W. O. Thompson, Chicago.—p. 842.

Military Surgeon, Washington, D. C.

87:401-496 (Nov.) 1940

Organization of the Medical Service of the German Army and Its Employment in the Campaign Against Poland. H. Hartleben.—p. 401.
Veterinary Inspection of Foods, Its Importance and Responsibility. O. E. McKim.—p. 409.
Human Convalescent Serum and Vaccination in Prevention and Treatment of Bacillary Dysentery. J. Felsen.—p. 417.
Use of Cortical Adrenal Extract in Treatment of Severe Burns. H. S. Ivory.—p. 423.
Value of Intra-Oral Radiographs in Diagnosis, Their Use and Abuse. R. W. Force.—p. 429.
Accidents in the Army and Their Prevention. S. A. Cohen.—p. 434.
Observations on Field Medical Service. W. H. Blanchard.—p. 443.
Facilitate Medical Processing. W. N. Lipscomb.—p. 452.
Conservation of Health in the Tropics. R. Skelton.—p. 459.
Surgeon James Mann's Observations on Battlefield Amputations. J. M. Phalen.—p. 463.

Minnesota Medicine, St. Paul

23:755-824 (Nov.) 1940

Clinical and Surgical Aspects of Spreading Peritonitis Complicating Acute Perforative Appendicitis. J. O. Bower, Philadelphia.—p. 755.
Diagnosis of Disease of Coronary Arteries. S. M. White, Minneapolis. —p. 767.
Coronary Disease—Its Treatment. F. J. Hirschboeck, Duluth.—p. 770.
Electrocardiogram in Coronary Disease. H. Oerting, St. Paul.—p. 775.
Pneumococcinosis. A. J. Lanza, New York.—p. 776.
Infected Dermoid Cyst of Thorax Simulating Chronic Empyema. H. K. Gray and R. Woodruff, Rochester.—p. 781.
Observations on Occurrence and Prevention of Sudden Death. J. F. Borg, St. Paul.—p. 783.
What's Wrong with the Patient Who is Always Tired? W. C. Alvarez, Rochester.—p. 787.
Polyneuritis with Facial Diplegia (Neuronitis) Following Serum Sickness in Adult. G. R. Kamman and M. Weisberg, St. Paul.—p. 789.
Primary Adenocarcinoma of Appendix and Carcinoid Tumors. F. C. Schuldt, St. Paul.—p. 791.

Spreading Peritonitis Complicating Appendicitis. — ower points out that the causes for the high mortality of cute appendicitis, as revealed by six surveys, are delay in hos- italization and laxatives. Results of a prophylactic campaign owed a consistent reduction of the mortality in each survey. prophylactic campaign has been conducted since 1933 roughout the state, and the first statewide survey was com- eted April 1, 1940. The results indicate that patients do ot e from acute appendicitis but from spreading peritonitis, that e prophylactic campaign is the surest method of reducing e mortality and that in considering a plan for prevention of eaths from appendicitis-peritonitis the prophylactic removal the appendix in the very young must not be overlooked. eaths can be eradicated by instruction in the schools, as the isease is one of youth. Most deaths occur between the ages 10 to 20. In Philadelphia high school students have been structed for ten years, in Pennsylvania for only five. The ortality is 2.44 per cent for Philadelphia and 3.39 per cent r Pennsylvania. Spreading peritonitis causes 92.4 per cent the appendicitis deaths. The abstracts of 38,085 clinical cords show that 1 in 271 died of acute appendicitis, 1 in 49 om appendical abscess and 1 in 4 from spreading peritonitis. atients admitted to hospitals with acute appendicitis with an tact appendix do not die from the disease, they die a catas- ophic death. Of 658 deaths (621 the result of spreading ritonitis) 118 were catastrophes: 29 unavoidable, 89 avoid- le. The 29 unavoidable catastrophes represent the hazards ncident to any group of comparable size. Of the avoidable aths, errors in surgical management were responsible for 71 and errors in diagnosis for 18. Some of the common errors in diagnosis are pneumonia, intestinal obstruction, ruptured cecum, ruptured duodenal ulcer, ruptured gastric ulcer, acute salpingitis, typhoid, diabetes, myelogenous leukemia and otitis media. The common errors in management are appendix ruptured on removal, anesthetic deaths, hemorrhage and postoperative venoclysis. Embolism, cardiac dilatation, coronary disease, myocarditis, thrombosis, atelectasis, apoplexy, pulmonary infarct and uremia caused the 29 unavoidable deaths. Rupture of an acutely inflamed appendix at operation was responsible for the greatest number of the avoidable deaths. This catastrophe occurred once in each 200 patients operated on in the presence of an intact appendix. If a surgeon at operation finds a perforated appendix, if he is doubtful as to whether or not the serous coat is intact or if hemorrhage cannot be controlled by ligature, the insertion of drains is justifiable. In 71 hospitals of the 181 surveyed, 118 operators did not drain the peritoneal cavity following removal of a perforated appendix in 126 patients and 74, or 58.73 per cent, died. What happens when perforations occur early and are accompanied by peritoneal trauma is seen by the following: Twelve of 70 patients operated on lived, 80 per cent of those that died received laxatives. They were operated on forty-eight hours after the onset of symptoms. The average time between perforation and death was 168 hours. These patients were operated on twenty-nine hours earlier and died seventy-two hours sooner than those with localizing processes. Why? Because the vulcanizing plastic-lymph patch was blown off or the cemented intestine or omentum was detached by laxative induced peristalsis. Of 1,118 patients with acute perforations operated on sixty-nine hours after the onset of symptoms 269, or 24.6 per cent, died on an average of two hundred and thirteen hours after the onset of symptoms. Of 1,154 patients admitted with subacute perforations—localizing processes—and operated on ninety-eight hours after the onset of symptoms 281, or 24.35 per cent, died three hundred and fourteen hours after the onset of symptoms. The mortality among 1,080 localized abscesses was 1.2 per cent. Among the 16,046 patients with localized masses the mortality was 0.06 per cent.

Occurrence and Prevention of Sudden Death. — Borg believes that sudden death due to ventricular fibrillation might be preventable if it was possible to select patients liable to this condition and counteract the action of epinephrine or to reduce the irritability of the heart muscle. He studied the records of all the patients who among the 22,490 admissions to Ancker Hospital during 1934-1935 died suddenly, unexpectedly and with no indicated or proved structural defect to account for such death. Certain facts emerged from this analysis which indicate the type of patient in which this accident has a tendency to occur. Some contributions indicate that quinidine modifies the action of the substance which presumably produces ventricular fibrillation and thus provides a rational basis for its prevention. During 1936, the third year of the study, quinidine sulfate was administered to patients who seemed liable to sudden death. The study involves 51 patients in whom death was unexpected. It was sudden in appearance and unexplained on a basis of structural change. Postmortem verification was obtained in 25. These deaths were among the 2,570 deaths that occurred in a total of 33,243 admissions to Ancker Hospital, St. Paul, during the three years. Among the 46 unexplained sudden deaths that occurred during 1934 and 1935 there were 39 men and 7 women. These deaths occurred at an advanced age, 76.1 per cent after 60, with the peak decade being that of the seventies. The electrocardiograms of 21 showed abnormal T waves and 8 showed QRS abnormalities, notching, slurring and widening. Twenty-nine had congestive failure, and 17 were in a state of good compensation. Fourteen (30.4 per cent) showed numerous ventricular premature contractions, and auricular fibrillation was present in 7. A definite diagnosis of heart disease was made for all but 2 of the patients. Degenerative heart disease, coronary sclerosis alone or associated with hypertensive heart disease, coronary thrombosis or aortic stenosis accounted for 78.3 per cent of the diagnoses. Sudden death in uncomplicated hypertensive heart disease accounted for only 4 cases, and syphilitic aortitis for 2. In the course of 1936 quinidine sulfate,

3 grains (0.2 Gm.) three times daily, was administered to all patients admitted to the hospital with degenerative heart disease, aortic stenosis or syphilitic aortitis. The drug was given in addition to other indicated therapy and discontinued if not well tolerated. Only 5 sudden deaths occurred, 4 in patients with coronary sclerosis complicated by hypertensive heart disease or coronary thrombosis with congestive heart failure, and 1 in a patient with advanced pulmonary tuberculosis with no recognized cardiovascular disease although permission for necropsy was refused. Of the 4 cases with degenerative heart disease, 3 had not received quinidine. Unless one of these cases is considered as a possible quinidine death, no patient with congestive heart failure who had received the drug in 1936 died suddenly nor did arterial emboli develop. The desirability of the continued use of quinidine to prevent sudden death is open to discussion. No known well controlled studies point to danger, and the present study does not indicate that it exists. The study suggests that a prolonged regimen of quinidine may extend a comfortable and useful existence for many patients with heart disease.

New England Journal of Medicine, Boston

223:695-744 (Oct. 31) 1940

The Care of the Patient. C. R. Austrian, Baltimore.—p. 695.
*Diagnosis of Marie-Strümpell Arthritis, with Certain Aspects of Treatment. H. F. Hare, Boston.—p. 702.
*Tuberculous Tenosynovitis. R. Adams, G. Jones and H. C. Marble, Boston.—p. 706.
Clinical and Electro-Encephalographic Changes Produced by Sensitive Carotid Sinus of Cerebral Type. J. Romano, E. A. Stead Jr. and Z. Eileen Taylor, Boston.—p. 708.
Nontraumatic Dislocation of Atlanto-Axial Joint. S. S. Hanflig and C. Schlosberg, Cambridge, Mass.—p. 713.
Some Epidemiologic Considerations of Diphtheria. V. A. Getting, Boston.—p. 717.

Marie-Strümpell Arthritis.—Hare states that during two years 1,179 cases of arthritis were encountered at the Lahey Clinic; 357 of these were of the rheumatoid type, and of these 21 (6 per cent) were of the Marie-Strümpell type. The etiology of the condition is unknown. Presumably it is a form of rheumatoid arthritis usually originating in the sacro-iliac articulations, accompanied or followed by inflammation of the apophysial joints or vertebral facets. It is a disease of young adults; the symptoms (pain, stiffness and limited spinal motion) start between the ages of 20 and 25 years. It is ten times more frequent in men than in women. The disease may be arbitrarily divided into three phases: the prespondylitic or early stage (characterized by shifting pains of a rheumatic nature in the limbs, chest and peripheral joints), the "sacro-iliitis" phase (during which phase the patient is frequently able to carry on his daily work because the discomfort is more marked at night, several hours after retiring) and as the disease progresses the "pokerback" period (associated with pain along the entire spine, stiffness and eventual rigidity). An increased sedimentation rate is a common observation. Roentgen diagnosis during the prespondylitic stage is not possible, as there are no demonstrable osseous or ligamentous changes. During the phase of sacroiliitis definite osseous changes may involve the sacro-iliac articulations, consisting of symmetrical changes of the sacro-iliac region, with increased density or osteosclerotic reaction surrounding the joint, with slight narrowing of the joint spaces. As the disease progresses, changes gradually become apparent around the apophysial joints or articulating facets, the joint spaces appearing narrowed or obliterated. Decalcification of the vertebrae and still later calcification of the ligaments may be observed. Gradually the entire spine appears to be fitted with a calcified casing partially obliterating the individual bony structures. This is known as the "bamboo" spine. The condition may be confused most frequently with degenerative arthritis, metastatic cancer, Paget's disease and other types of rheumatoid arthritis. Bed rest with the spine held in extension has been successful in relieving pain and preventing and correcting deformities, but because the disease is slowly progressive it must be carried out over a long time during which there is gradual muscle wasting, and rehabilitation becomes necessary. Swaim suggests putting the patient to bed until pain is relieved and then giving him a form-fitting jacket to wear. This has been successful in preventing deformities and, according to him, largely relieves pain and prevents involvement of the peripheral joints. Hare has found that roentgen therapy relieves pain in about 80 per cent of cases. The maximal number of treatments given to any one patient has been twenty. A patient, followed for two years, has received no treatment during the last year and has had no discomfort. The best test of radiation therapy has been that 33 of the 35 patients seen at the clinic during three years are now able to work; this includes 5 patients who were formerly incapacitated. Radiation therapy is directed to the entire spine, the sacro-iliac joints and the paravertebral and gluteal muscles. Small doses give relief. The author uses six portals of 300 sq. cm. each and treats one portal daily, administering 300 roentgens to each portal. The following factors are employed: from 150 to 200 kilovolts, 20 milliamperes, from 0.25 to 0.5 mm. of copper and 1 mm. of aluminum filters and a distance of 50 cm. Relief of pain may occur during the first week, or two or three weeks following irradiation. If pain recurs it may usually be relieved by a single small dose of roentgen rays. When pain is relieved it is advisable to refer the patient to the orthopedic surgeon for muscle-building exercises and correction of existing deformities.

Tuberculous Tenosynovitis.—Adams and his co-workers analyze the diagnostic and therapeutic features of the 36 cases of tuberculous tenosynovitis observed at the Massachusetts General Hospital during the last forty-five years. The youngest patient, complaining of symptoms for a year and a half, was 15 years of age; the oldest patient was 75 and had had symptoms for three years when first seen. The average age of the patients was 36 years. There were 21 males and 15 females. The right hand was involved twenty-two times and the left hand fourteen times. The volar surface was involved twenty-five and the dorsal surface thirteen times. The influence of use on incidence is shown by the high involvement of the right hand. The occupations varied widely. There were no laborers, but 30 patients made hard use of their hands. Eight patients complained of definite antecedent trauma. Thirteen of the patients had tuberculosis elsewhere in the body. Diagnosis in the early stages may be difficult. The typical feature is a gradually developing, painless or slightly tender mass on the volar aspect of the hand. Partial stiffness with inability completely to flex or to extend the fingers and diminished strength on grasping are common. One of the most valuable diagnostic aids is a four hour temperature chart over a period of several days. A daily rise in temperature to 99.6 or 100.6 F. is suggestive of tuberculosis and should lead to further study. In suspected cases, splinting should be employed from the beginning. Finger motion in the later stages of the disease may cause creaking or grating sounds because of degenerated fibrinous deposits within the tendon sheath—so-called rice bodies. Joint stiffness and a fluctuant mass often indicate osseous disease, which may be proved by roentgen demonstration of destruction of the carpus. The diagnosis was proved pathologically in 27 of the cases and established beyond a reasonable clinical doubt in 9. The diagnosis of tuberculous tenosynovitis has been equivalent to the recommendation of operation; 33 of the 36 patients were so treated. Incision and drainage of fluctuant masses was carried out in 9 cases and resection of the involved tendon sheaths in 24. Follow-up notes are available in 26 of the 36 cases and in 23 of the ones in which operation was performed. Two of the 3 patients not operated on recovered completely and resumed their work. The third is unimproved and suffers also from pulmonary tuberculosis. Of the 23 patients who were operated on 7 are unimproved, 8 are improved and 8 have the condition in an arrested form. The best results were obtained when operation was performed during the second or third year of the disease. These results are none too good. No other tuberculous condition, with the possible exception of tuberculous lymph nodes of the neck, has been subjected to surgery with such casualness and lack of accessory data. Tuberculosis of the tendon sheaths should receive the same systemic treatment accorded to tuberculosis of the lungs or spine. Surgical attack on a tuberculous focus such as a tendon sheath without knowledge of how the lesion is progressing involves the likelihood of operating in the presence of advancing or exudative disease. Such knowledge can be gained only by periodic observation, during which time treatment in the form of splint immobilization and sanatorium type of care should be given. The tuberculous patient must demonstrate resistance and

an ability to localize infection before operation is considered. Attempts at extirpation under other circumstances constitute meddlesome surgery. Drainage procedures for abscesses about the hand to relieve mechanical pressure often bring relief of symptoms but rarely arrest the disease, because the active focus remains. Kanavel has stated that complete removal of tuberculous tendon sheaths or tuberculous tendons will effect a cure. If true, this means that before excision the exudative phase must be over and the fibrotic phase well under way. Six of the authors' 10 arrested cases were instances in which the hand was disabled by the sequelae of an infection that became quiescent; that is, by fibrosis of tendon sheaths, adherent tendons and rice bodies.

223:745-788 (Nov. 7) 1940

Insulin Resistance: Report of Case. J. F. Regan, J. J. Westra and R. M. Wilder, Rochester, Minn.—p. 745.
*Treatment of Leukemia by Radioactive Phosphorus. S. Warren, Boston.—p. 751.
Notes on History of Rheumatism and Gout. R. S. Hormell, Boston.—p. 754.
*Carcinoma of Breast in 10 Year Old Girl: Report of Case. J. B. Sears and M. J. Schlesinger, Boston.—p. 760.
Treatment of Lobar Pneumonia with Sulfathiazole and Sulfapyridine. M. Cutts, A. M. Burgess and F. H. Chafee, Providence, R. I.—p. 762.
Cardiology: I. Management of Cardiac Patients Who Require Major Surgery: II. Treatment of Cardiac Arrhythmias. H. L. Blumgart, Boston.—p. 765.

Treatment of Leukemia by Radioactive Phosphorus.—Warren calls attention to experiments on the effect of radiation from temporarily radioactive phosphorus on cells and tissues and to cases of leukemia which were treated by Lawrence and his associates with radioactive phosphorus from the Berkeley cyclotron. The author selected for this treatment cases of acute and subacute leukemia, since in them the established methods of radiation therapy leave much to be desired. The radioactive phosphorus was chiefly obtained from the Harvard cyclotron. Red phosphorus bombarded in the target chamber of the cyclotron was utilized in the beginning. Later, in order to obtain a more concentrated source, phosphorus in the form of iron phosphide was placed on a probe within the deuteron stream of the cyclotron. A portion of the phosphorus was thus made radioactive. This phosphorus has a half-life of 14.5 days and gives off a fairly penetrating beta radiation. The phosphorus thus treated was changed by standard chemical methods to dibasic sodium phosphate. This was calibrated as to radioactivity on a modified Lauritsen type electroscope. The desired amount of radioactive phosphorus, ranging from 1 to 4 millicurie equivalents, was dissolved in 5 per cent dextrose and physiologic solution of sodium chloride prepared for intravenous use, sterilized and injected intravenously into the patients. Animal experiments show that the injected phosphorus is absorbed selectively in the various organs and tissues. Fortunately, those in which the major deposit of leukemic cells occurs (bones, liver, kidneys and spleen) take up relatively large amounts. In all cases the excretion of radioactive phosphorus was followed in the urine. The concentration in the blood was checked from time to time in order that excessive doses might not be given. Large doses of radioactive phosphorus have been shown to produce marked fibrosis and aplasia of the hemopoietic tissues. The author presents 4 case reports in which this treatment was employed. Some improvement was seen in 2 patients as evidenced by their general condition, level of white cell count and the state of the bone marrow. These patients are moderately active. Two patients showed no significant response beyond minor changes in white cell count; both have since died. This therapy is experimental and does not displace present methods of irradiation in the treatment of leukemia.

Carcinoma of Breast in 10 Year Old Girl.—According to Sears and Schlesinger, only 2 well authenticated cases of breast cancer before puberty have been reported in the last three decades. They concerned girls of 11 and 12 years, respectively. The authors present the history of a girl, aged 10, who was brought to their hospital because of a lump in the right breast. Six years previously her mother had noted the lump. The child said she had hit her right chest on a car door that day. The mother believed that it might have grown during the previous year. There was no history of pain or tenderness. Physical examination revealed a nodule 3 by 2.5 by 2.5 cm. under the right nipple. It was hard, irregular, sharply circumscribed, nontender and adherent to the overlying nipple, which was flattened. Roentgen examination of the tumor showed no evidence of calcification; that of the long bones, skull and chest showed no evidence of metastases. The breast tumor and pectoral fascia were excised. A curved incision was made along the lower aspect of the tumor, which was exposed and found to be resting on the pectoral fascia. Immediate examination by frozen section disclosed a carcinoma. A wide area of skin was excised, together with the fascia overlying the pectoralis major. No lymph nodes were felt on the border of the pectoralis or in the axilla. The wound was closed without drainage. At the end of the year there was no evidence of recurrence.

New Jersey Medical Society Journal, Trenton

37:529-566 (Nov.) 1940

Diarrhea: Causes and Treatment. M. Kraemer, Newark.—p. 533.
Differential Diagnosis of Neoplasm and Primary Vascular Disease of Intracranial Cavity. J. Browder, Brooklyn.—p. 537.
Movements of Human Uterus Before and During Labor. D. P. Murphy, Philadelphia.—p. 538.

New Orleans Medical and Surgical Journal

93:223-276 (Nov.) 1940

Carcinoma of Pancreas: Clinical Review of Eight Cases. T. P. Lloyd and W. F. Drummond, Shreveport, La.—p. 223.
Cause and Prevention of Loss of Teeth. C. C. Bass, New Orleans.—p. 227.
Advanced Pathology of Esophagus: Report of Case. J. E. Knighton Jr., Shreveport, La.—p. 231.
Immunization Against Disease in Infants and Children. H. A. White, Alexandria, La.—p. 236.
Rheumatic Infection in Children in the Deep South. J. E. Bailey, New Orleans.—p. 240.
Some Facts About Premature Infants. C. T. Williams, New Orleans.—p. 244.
Indications and Contraindications for Surgical Intervention in Treatment of Abortion. P. Graffagnino, New Orleans.—p. 247.
Why We Should Be Familiar with Roentgenologic Appearance of Developmental Changes of Skeleton. A. Mayoral, New Orleans.—p. 250.
Glaucoma: Responsibility of the General Practitioner. M. C. Wilensky, New Orleans.—p. 254.
Splenectomy and Purpura Haemorrhagica. M. Finn, New Orleans.—p. 259.

New York State Journal of Medicine, New York

40:1557-1624 (Nov. 1) 1940

Cryotherapy and Its Relation to Hibernation. W. L. Whittemore, J. R. Lisa and P. K. Sauer, New York.—p. 1563.
Treatment of Some Common Disfigurements of the Skin. A. B. Cannon, New York.—p. 1567.
Problems in Diagnosis and Treatment of Recurring Vesicular Eruptions of Hands. F. Wise and J. Wolf, New York.—p. 1573.
Fluorography: Its Technic and Application. I. S. Hirsch, New York.—p. 1579.
Physical Defects and Juvenile Delinquency. E. W. Wallace, Buffalo.—p. 1586.
Responsibility of the Pediatrician in Regard to Children's Eyes. B. F. Payne, New York.—p. 1591.
Infrequency of Toxoid Reactions in 11,326 School Children. J. H. Landes, New York.—p. 1594.
Report of Intensive Laboratory Studies of High School Athletes. L. S. Preston, Oneida.—p. 1599.
The School Physician and the Care of the Athlete. R. H. Broad, Ithaca.—p. 1603.
Vertebral Hemangioma with Neurologic Symptoms. L. M. C. Kelly, New York.—p. 1607.

40:1625-1692 (Nov. 15) 1940

Progress in Ophthalmology. A. J. Bedell, Albany.—p. 1631.
Chronic Heart Diseases—Diagnosis and Treatment. C. E. de la Chapelle, New York.—p. 1638.
Causes and Relief of Symptoms Following Cholecystectomy. R. F. Carter and B. Marrafino, New York.—p. 1648.
Chronic Nontuberculous Renal Infections: Their Significance and Treatment. W. W. Scott, Rochester.—p. 1655.

Northwest Medicine, Seattle

39:393-434 (Nov.) 1940

Ileostomy Preliminary to Resection of Gastrojejunocolic Fistula. J. W. Baker, Seattle.—p. 398.
Diagnostic Considerations of Intracranial Neoplasms. A. L. Sahs, Iowa City.—p. 403.
Diagnosis of Brain Tumor. P. G. Fluthow, Seattle.—p. 406.
Headaches. E. D. Warren, Tacoma, Wash.—p. 412.
Vascular Syndrome Headache: Report of Case with Note on Mechanism of Histamine Therapy. J. H. Besson, Portland, Ore.—p. 416.
Treatment with Vitamins. D. L. Wilbur, San Francisco.—p. 417.

Surgery, St. Louis

8:739-902 (Nov.) 1940

*Congenital Prepyloric Membranous Obstruction in Premature Infant. A. S. W. Touroff and R. M. Sussman, New York.—p. 739.
Cerebral Herniation Through Incisura Tentorii: Clinical, Pathologic and Experimental Study. W. L. Reid, Montreal.—p. 756.
*Cerebellar Subdural Hematoma in Infant 2 Weeks Old with Secondary Hydrocephalus: Operation with Recovery. R. G. Coblentz, Baltimore. —p. 771.
Note on Straightening the Hypospadiac Penis. C. D. Creevy, Minneapolis.—p. 777.
Hypospadias. H. W. Meyer, New York.—p. 781.
Improved Apparatus for Tidal Drainage of Urinary Bladder and Empyema Cavities. C. J. Bellis, Minneapolis.—p. 791.
Perineal Prostatectomy: Modification of Closure. S. A. Vest, University, Va.—p. 798.
Principles and Practice of Radical Operations for Hernia. E. Pülya, Budapest, Hungary.—p. 804.
Osteomyelitis of Jaws: Analysis of Fifty-Nine Patients. E. C. Padgett, Kansas City, Mo.—p. 821.
*Paravertebral Procaine Block in Treatment of Postoperative Atelectasis: Preliminary Report. J. A. Gius, Portland, Ore.—p. 832.
Study of Capillary Permeability and Inflammation in Skin of Rabbit Given Adrenalin. R. H. Rigdon, Memphis, Tenn.—p. 839.

Congenital Prepyloric Obstruction.—Touroff and Sussman report a case of congenital gastric obstruction in a premature infant due to a complete prepyloric septum of mucous membrane. Three and possibly all 4 offspring of the patient's father and the father's 2 sisters suffered from some congenital anomaly; all but the patient died in infancy. Symptoms of high obstruction commenced at birth. Additional features were failure of the child to pass meconium, and icterus which was more intense than normal. These manifestations suggested additional obstructive anomalies of the lower intestinal tract and biliary duct system. Roentgen examination revealed an obstructive lesion in the distal portion of the stomach or first portion of the duodenum. Operation, on the fifth day of life, consisted of multiple incisions of the prepyloric septum and pyloroplasty. No other anomalies were found. The early postoperative course was uneventful. The icterus was concluded to be an accompaniment of prematurity and failure to pass meconium as due to a lack of the normal stimulus to intestinal peristalsis, which apparently is initiated by the passage of gastric contents into the duodenum. On the eighteenth postoperative day a secondary, complete intestinal obstruction developed, and five days later, when another operation was about to be performed, the obstruction was relieved spontaneously. The course thereafter, although temporarily stormy, was one of improvement ending in recovery. Roentgenograms taken five months after operation revealed the gastrointestinal tract to be normal except for rapid emptying of the stomach and intestinal hypermotility. The follow-up period now is seventeen months. To the authors' knowledge the case is the first of its kind to be reported.

Cerebellar Subdural Hematoma.—Coblentz presents the history of an infant of 2 weeks who recovered after an operation for an encysted subdural hematoma. The author believes that his is the first case to be recognized during life and cured by operation. The hematoma was located over the right cerebellar hemisphere. Secondary hydrocephalus also was present. Although there was no definite history of trauma, ecchymosis of the upper lids and a moderate occipital caput led the author to suspect slight trauma as the most likely etiologic factor. Prompt disappearance of blood in the lumbar subarachnoid fluid after daily lumbar punctures and continued increased intracranial pressure indicated a coexisting lesion. Subdural hematoma over the cerebral hemispheres was ruled out by subdural taps. Ventriculography definitely located the lesion in the posterior fossa. Evacuation of the clot through a small trephine opening without drainage effected a cure. At the time of writing, the baby is 3 months old and has made a complete recovery.

Paravertebral Procaine Block for Postoperative Atelectasis.—Gius treated successfully 2 cases of postoperative atelectasis in children by paravertebral block anesthesia of the operative wound. He suggests that this procedure, which temporarily abolishes pain in the wound and allows for active hyperventilation of the lungs and effective coughing, may prove to be an important adjunct to the methods now used for combating the condition. The operative wound must be supported so that the possibility of separation following violent coughing will be obviated. During the period when atelectasis is most likely to occur, catgut sutures are said to retain their maximal strength. The added strain of severe coughing may occasionally break or tear out the sutures, but urgent measures are warranted if atelectasis is to be avoided. The author points out that the results in his 2 cases were so striking that there seems to be no doubt that anesthesia of the wound was a significant factor in the rapid clearance of symptoms and signs. These cases can hardly be regarded as a conclusive test of the procedure, yet the results observed convince him that the method is practical.

Texas State Journal of Medicine, Fort Worth

36:463-526 (Nov.) 1940

Extrinsic Lesions of Heart. C. S. Beck, Cleveland.—p. 468.
Evolution of Major Surgery in Treatment of Pulmonary Tuberculosis. L. F. Knoepp, Shreveport, La.—p. 472.
Systematic Use of Streptomycin in Treatment of Decompensation of Heart. F. V. Grumbeam, Houston.—p. 476.
Abdominal Conditions in Children, with Special Reference to the Mechanical Appendix. A. Brown, Toronto.—p. 482.
Acute Leukemias. W. N. Powell, Temple.—p. 486.
Diagnosis and Treatment of Cancer of Pharynx. A. C. Christie, Washington, D. C.—p. 490.
Prenatal Blood Changes. R. L. Grogan, Fort Worth.—p. 494.
Management of Certain Perforating Wounds of Eyeball: Report of Cases. E. M. Sykes, San Antonio.—p. 497.
The Training of Medical Technologists in Texas. J. J. Andujar, Fort Worth.—p. 503.
Spasm of Inferior Oblique with Head Tilt. M. K. McCullough, Dallas. —p. 507.

Western J. Surg., Obst. & Gynecology, Portland, Ore.

48:645-714 (Nov.) 1940

Consideration of Recent Additions to Clinical and Experimental Knowledge of Breast Conditions. F. E. Adair, New York.—p. 645.
Value of Oxygen and of Helium-Oxygen Mixtures Before and After Thyroidectomy. W. M. Boothby and S. F. Haines, Rochester, Minn. —p. 662.
Treatment of Traumatic Brain Injuries. P. G. Flothow, Seattle.—p. 670.
*Incidence of Venereal Diseases in Cases of Male Impotence and Male Sterility. M. Huhner, New York.—p. 676.
Clinical versus "Pathologic" Appendicitis. C. A. Bachhuber and W. A. Bayley, Los Angeles.—p. 677.
New Method of Colostomy and Ileostomy. M. E. Steinberg, Portland, Ore.—p. 682.
Final Report of Case of Malignant Adenoma of Parathyroid Glands. E. M. Hall and L. Chaffee, Los Angeles.—p. 685.
Value of Electroencephalogram in Craniocerebral Injuries. M. A. Glaser and H. Sjaardema, Los Angeles.—p. 689.
Congenital Equinovarus. L. Cozen, Los Angeles, and W. Greene, Boston.—p. 697.
Diagnosis and Curability of Papillary Adenocarcinoma of Thyroid Gland: Case Report. F. S. Wetherell, Syracuse, N. Y.—p. 707.

Venereal Disease, Male Impotence and Sterility.—Huhner, in studying the records of 800 consecutive cases of male impotence, found that 30 per cent of them had a history of previous venereal infection; likewise a similar history was given by 36 per cent of more than 200 sterile men. These figures contrast well with the statistics of gonorrhea, which show that about 80 per cent of unmarried men less than 30 years of age have had at least one gonorrheal infection. The great majority of the venereal infections among the author's patients were gonorrheal. A history of syphilis was a rarity in either the impotence or the sterility cases. However, in the majority of cases the gonorrhea had been acquired when the patient was quite young and had been cured permanently many years before the onset of the impotence. Gonorrhea is really hardly ever a cause of male impotence. Azoospermia is found in a large number of cases of male sterility. The condition is due to occlusion of the vasa due to an untreated or badly treated gonorrhea in which the infection passed into the posterior urethra and into the vasa. As a rule the gonorrheal infection stops with the occlusion of the tubes, but occasionally it goes still further and in some manner destroys the spermatogenic function of the testicles.

West Virginia Medical Journal, Charleston

36:489-536 (Nov.) 1940

Treatment of Sinusitis. W. C. Bowers, New York.—p. 489.
Appendicitis: Analysis of 1,588 Cases Treated Surgically. H. G. Camper and H. A. Bracey, Welch.—p. 499.
Management of Acute Appendicitis—Arguments and Controversies. H. B. Stone, Baltimore.—p. 505.
Conception of Cancer as Related to Preoperative Irradiation. R. M. Cash, Washington, D. C.—p. 511.
Traumatic Appendicitis: Report of Case. C. H. Engelfried, Montgomery.—p. 516.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

2:513-544 (Oct. 19) 1940

Role of Liver in Diabetes Mellitus. G. Graham.—p. 513.
Sulfhydryl Compounds and Wound Repair. J. F. Riley.—p. 516.
Respirator as an Oxygen Apparatus. H. L. Marriott.—p. 519.
*Contusion of Myocardium. H. Barber.—p. 520.
Anaphylaxis After Injection of Tetanus Toxoid. A. A. Cunningham.—p. 522.

Contusion of Myocardium.—Barber points out that a blow over the chest or compression of the thorax may cause a variety of traumatic heart lesions. The site of the cardiac lesion is not necessarily related to the site of the blow. The anterior aspect of the right ventricle is injured most frequently. There are many records of myocardial injury in the absence of fractures or signs of external bruising. During the last two years in studying heart injuries in fatal accidents the author found that they are more frequent than expected. He gave particular attention to less serious lesions, compatible with recovery of patients who died from causes apart from the heart. These have been sufficient in number to suggest that recovery from undiagnosed myocardial contusion is by no means rare. The most convincing evidence that a blow over the chest may injure the myocardium is obtained from records of cases described as delayed rupture of the heart. An example is that of a young man who was struck over the front of the chest by a cricket ball. After a short interval he continued to play throughout that and the second day. The second evening he complained of pain in the chest and died shortly afterward. At necropsy a rupture of the right ventricle was seen, with hemorrhage into the pericardium. Rupture occurred at varying intervals, most commonly between one and two weeks after the injury, but sometimes considerably later. This rare event is probably the result of a blow which ruptures the endocardium. Physical signs of localized myocardial injury are negligible unless some transient changes in the T wave of the electrocardiogram can be detected. In trauma to a valve the symptoms of distress are immediate, but in myocardial contusion there may be an interval between the injury and the more obvious symptoms. If there has been a chest injury, whether severe or apparently slight, any symptom suggesting heart disability must be considered. There may be dyspnea, a feeling of oppression in the chest, perhaps with anginal pain, and possibly the expectoration of frothy sputum. Obvious symptoms followed by complete recovery furnish reasonably clear proof of a contusion. Routine roentgen examination of chest injuries in the accident wards might reveal unsuspected hemorrhagic pericardial effusions. The symptoms which follow a blow may arise when the contusion involves the pericardium. A permanently inefficient heart, myocardial weakness, may follow trauma such as fracture of several ribs. Such patients differ from those with effort syndrome in that they usually are quite free from the nervous element. Barber and Osborn have reported the finding at necropsy of a deep-seated scar in the heart muscle twenty-two years after trauma to the mitral valve. Heart block, especially temporary, following trauma may be considered as proof of a deep-seated contusion. Clinical signs typical of angina pectoris, auricular fibrillation or valve rupture may follow a blow over the chest. The clinical history and the clinical features are the most important diagnostic guides.

Medical Journal of Australia, Sydney

2:301-330 (Oct. 5) 1940

*Management of Cerebral Gliomas. G. Phillips.—p. 301.
*Use of Histamine in Treatment of Neurovascular Headache. W. L. Reid.—p. 307.

Cerebral Gliomas.—Phillips reports two deaths in a series of 35 consecutive cases of cerebral or cerebellar tumors removed surgically. One death occurred eight weeks after operation as a result of an accident, while the other occurred fourteen days after operation as the result of intracranial hemorrhage. Twenty-eight of the 35 operations were performed in the presence of a large space-occupying lesion in the skull associated in each instance with a considerable increase of intracranial pressure; 1 patient died as the result of late wound infection. The results substantiate the claim that with adequate management cerebral tumors may be exposed and removed with a relatively low surgical mortality rate. Operation under local anesthesia makes this possible. The patient's ability to complain of pain, cold and discomfort, and the opportunity to provide adequate fluid by mouth during prolonged surgical procedures, are constant guardians against cerebral shock. Except in children, the author rarely uses general anesthesia. Twenty-two of the intracranial tumors were gliomas. In 10 cases the whole tumor was removed, the greater part of the tumor in another 8, and in 4 for various reasons no attempt was made to remove the tumor, which after exposure was treated by high voltage roentgen radiation. The author believes that, irrespective of the skill of the surgeon, operations for cerebral glioma will frequently be succeeded by a fatality if these tumors are lumped together as a single group and submitted to indiscriminate surgery. Particularly is this so since nearly 40 per cent are glioblastomas. A major responsibility for the surgeon is to equip himself with the frequency, location statistics and full life history of cerebral gliomas. The capacity for diagnosing cerebral gliomas preoperatively is almost the sine qua non of continued success. The pertinent facts regarding glioma are as follows: The percentages for the different types of gliomas are: glioblastomas 40, astrocytomas 40, medulloblastomas 12, oligodendrogliomas 2, ependymomas 2 and all the rare types 4. The average postoperative survival period for the respective tumors has been twelve months, from six to ten years, from two to four years, more than six years and for the rare types the survival time is variable. The average age at which glioblastomas occur is between 40 and 60, for astrocytomas of the cerebrum it is 30 and for those of the cerebellum 13, for the medulloblastomas 10 and oligodendrogliomas 30 years; the ependymomas and the rare types occur at various ages.

Histamine for Neurovascular Headache.—Reid gave small repeated subcutaneous doses of histamine to 5 patients with neurovascular type of headache. One patient experienced only partial relief, while the other 4 obtained complete relief. Each patient, after the possibility of an intracranial pathologic lesion was excluded and the patient reacted positively to an intradermal test injection of histamine, was given graduated doses of histamine in the following manner: The solution used consisted of 1 mg. of histamine dissolved in 10 cc. of physiologic solution of sodium chloride. On the first and second days 0.05 mg. of histamine (0.5 cc. of the solution) was injected subcutaneously twice a day; on the third and fourth days, 0.075 mg. (0.75 cc. of the solution). Thereafter, up to the end of the third week, 0.1 mg. (1 cc. of the solution) was given twice a day. When this course was finished, each patient was given one injection of 0.1 mg. of histamine once a week. If the patient remained free from symptoms during the next two or three months, an attempt was made to decrease the dose by spacing the injections. If the symptoms recurred after the dose was diminished, the injections were again increased to one a week. The author applies the term "neurovascular headache" because there is fairly conclusive proof that the aura and pain in many complaints of head pain are due to a disturbance of the neurovascular mechanism controlling certain intracranial and extracranial blood vessels. Of the various patterns of this group, migraine is perhaps the best known. There are several other patterns which have a neurovascular mechanism, and some of these are as common as the classic migraine. It is emphasized that the use of histamine must not be regarded as a cure-all for every type of headache. Each case must be thoroughly investigated and only when all possibility of a pathologic lesion has been excluded should a neurovascular mechanism be considered.

South African Medical Journal, Cape Town

14:351-370 (Sept. 28) 1940

Sterility in Women and Its Treatment. G. S. van der Merwe.—p. 355.
Dermatitis Artefacta. J. A. Levitt, S. Gordon and M. J. Cohen.—p. 359.
Observations on Fractures of Shaft of Femur. E. V. Humphries.—p. 362.

Schweizerische medizinische Wochenschrift, Basel

70:901-924 (Sept. 21) 1940. Partial Index

Fluid Current in Blood, Tissue Clefts and Lymph Channels. O. Müller. p. 901.
Experiences with Erection of Vertebral Fractures. A. Fehr.—p. 906.
Cytotoxicology of Some Pharmaceutic Preparations (Arsenic, Colchicine, Acriflavine Hydrochloride, Nicotine and Nikethamide) on Basis of Investigations on Tissue Cultures. O. Bucher.—p. 910.
*Problems of Physiologically Correct Bread-Grain Food. W. Kraft.—p. 913.

Physiologically Correct Bread.—According to Kraft, increased knowledge regarding vitamins and mineral substances has terminated the dispute about the degree of utilization of bread grains and has established the principle of complete utilization of the grain. He describes the structure of the cereal grain and the production of flour. Eight decades ago the production of flour was changed in such a manner that the most valuable parts of the grain, the cereal germ and the external layers, were removed during the process of milling. Since these parts contain valuable proteins, vitamins, lipoids, ferments, minerals, cellulose and pectins, the resulting flour was much inferior to the whole grain flour of the older days. The author stresses particularly the loss of vitamin B_1 from the "fine" flour produced by modern methods of milling. He discusses the vitamin B_1 requirements of the human organism and stresses the necessity of returning to the use of whole grain flour. The bread which has been introduced during the war, although it utilizes the grain to a fuller extent than was the case before, is still inadequate because the germ and part of the external layers are still being eliminated for the reason that flours which retain these parts are not suitable for long storage. The author suggests that the entire grain be utilized and that only fresh flour be used for the production of bread. It is better to bake the flat type of bread than the loaf type when using flour from whole grain.

Riforma Medica, Naples

56:971-996 (Aug. 3) 1940. Partial Index

*Vertebral Pseudarthrosis. V. Putti.—p. 971.
Internal Leishmaniasis and Reticulo-Endothelial System. G. Murano.—p. 975.

Vertebral Pseudarthrosis.—Putti reports roentgenologic studies of the spine in several cases of so-called Kümmell's disease. He believes that the condition is a pseudarthrosis resulting from a vertebral fracture that has not been immobilized. Failure to place the fragments in a position favorable for consolidation results in lack of formation of callus, absorption of the surfaces of the bony fragments that are in contact and erosion of one of the surfaces from improper contact with the opposing surface. The treatment is that of pseudarthrosis and consists of prolonged immobilization for reduction and consolidation of small fractures of short duration, and of prolonged immobilization after transplantation of small bone fragments in cases of long duration, especially if the fracture is complicated by porosis of the vertebra. The author reports 3 cases. In 1 the fracture occurred twenty-two years ago. Functional, painful symptoms became aggravated whenever the patient attempted to follow a moderately active existence. A gibbus developed sixteen years after occurrence of the fracture. Satisfactory anatomic and functional results were obtained from vertebral osteosynthesis with two tibial fragments followed by prolonged immobilization in a cast. The author emphasizes the importance of roentgen examination of the spine in all cases of vertebral trauma for the early diagnosis and treatment of vertebral fractures and prevention of vertebral pseudarthrosis.

Archiv für Kinderheilkunde, Stuttgart

120:1-48 (May 31) 1940

Observation on a Virus in German Measles. H. Steinmaurer.—p. 1.
*Treatment of Toxic Diphtheria with Large Doses of Serum and Ascorbic Acid. F. Szirmai.—p. 23.
Anemia of the Newborn. Maria Mainka.—p. 40.

Serum and Ascorbic Acid in Toxic Diphtheria.—According to Szirmai, many investigators have demonstrated that ascorbic acid neutralizes the toxin of diphtheria not only in the test tube but also in the living organism and that it increases the resistance of experimental animals against this toxin. In addition to clinical experience the author made experimental studies by testing the effect of ascorbic acid on the Schick reaction. Observations made in the course of these experiments indicate that in the treatment of diphtheria only ascorbic acid itself and not its neutralized solutions should be used. The author thinks that the action of ascorbic acid is due to its nonspecific detoxication of the diphtheria toxin. It has not been definitely decided whether the oral or the intravenous administration of ascorbic acid is the best, and whether saturation of the organism is necessary. According to Friedemann's classification there are two types of toxic diphtheria which differ in regard to their prognosis, the edematous and the hemorrhagic-necrotic type. The more frequent and less malignant edematous type is characterized by edema (often unilateral) of the soft palate, gelatinous, infiltrated and slightly formed pseudomembranes and by indistinctly outlined cervical lymph nodes surrounded by subcutaneous edema. In the hemorrhagic necrotic type the membranes are likewise not extensive at first, but they are circular or oval, sharply defined and thick and of a dirty brownish red and later spread rapidly. A bloody, irritating nasal discharge and cutaneous and mucous hemorrhages appear. In both forms there exist foetor ex ore and adenoiditis with impaired nasal breathing. If serotherapy is begun too late or is inadequate, albuminuria, restlessness, pallor and myocarditic symptoms develop. The local and generalized symptoms in which malignant diphtheria differs from simple pharyngeal diphtheria are regarded by the author as the manifestation of an intensive action of diphtheria toxin, but the formation of the pseudomembrane he regards as a direct action of the diphtheria bacilli. He considers the edema and the hemorrhagic necroses and not the pseudomembranes as the characteristics of malignant toxic diphtheria. In the edematous form of toxic diphtheria, he was able to reduce the mortality greatly by the simultaneous administration of large doses of serum, intravenously as well as intramuscularly, and of ascorbic acid. Whereas before the introduction of this combination therapy fifteen fatalities occurred among 54 edematous cases of malignant diphtheria (27.8 per cent), only one occurred in 18 cases (5.5 per cent) with this combination therapy. The success of this treatment depends on the recognition of early signs of toxicity. The author is unable to say whether the combined administration of large doses of serum and ascorbic acid will be effective also in the hemorrhagic-necrotic form of toxic diphtheria, for no cases of this type were observed in the last few years.

Deutsche medizinische Wochenschrift, Leipzig

66:309-336 (March 22) 1940. Partial Index

Early Symptoms of Tumors of Spinal Cord. M. de Crinis.—p. 309.
Diagnosis of Commotio Cerebri. E. Bay.—p. 312.
*Importance of Skull Trauma for Development of Organic Cerebral Changes. H.-H. Meyer.—p. 316.
*Full Extracts of Belladonna in Therapy of Encephalitis. F. Scheiffarth.—p. 318.
Tumor of Spinal Cord and Diabetes. L. Roemheld.—p. 321.
Reduction of Intra-Ocular Pressure in Poisoning with Salicylic Acid Preparations. J. Várady and F. Jahn.—p. 322.
Demonstration of Erythrocytes with Basophil Stippling in Sternal Punctate of Patients with Lead Poisoning. N. Henning and H. Keilhack.—p. 323.

Skull Trauma and Organic Cerebral Changes.—According to Meyer, the importance of skull trauma for the brain has received greater attention in recent years because of the increase in traffic accidents. He reports two cases, in both of which the skull trauma seemed to be of a harmless nature. There had been no injury to the bones of the skull nor had there been loss of consciousness or vomiting. Acute exacerbation developed after four and thirty-one days respectively, probably as the result of a hemorrhage. One patient developed hemiplegia and speech disturbance, and the other symptoms of pressure on the brain and epileptiform attacks. These cases demonstrate that the lack of symptoms immediately after the trauma does not prove that the brain has escaped injury. The interval between the trauma and the appearance of severe cerebral symptoms may vary greatly. There have been cases of skull trauma in which epileptiform attacks, jacksonian attacks and metabolic disturbances developed years later. Encephalographic examination is an important aid in many cases. The displacement and widening of the ventricles and differences in the visualized subarachnoid space permit important conclusions. It may be assumed that such changes are partly due to tissue

destruction, to shrinkage of the tissues or to glial scars and tensions produced by cicatrices. Great care is necessary in the estimation of encephalographic pictures, because not all changes have a traumatic origin. If these are observed in cases in which the history reveals a cranial trauma, one is justified in ascribing them to this trauma.

Belladonna in Therapy of Encephalitis.—Scheiffarth reviews observations made in the course of treatment of encephalitic and other extrapyramidal disturbances. In his discussion of the pharmacologic therapy of extrapyramidal motor disturbances he is concerned chiefly with those forms which belong to the amyostatic symptom complex, that is to the anomalies of the tonus. The fact that the motility disturbances, hyperkinesias and compulsion movements are hardly at all influenced suggests that the limited success of therapeutic measures is due not so much to etiologic as to localization and to physiologic differences. It is known that morphologic changes in the substantia nigra and the striatum are the anatomic foundations of those tonus disturbances which are found in some of the extrapyramidal diseases, the so-called amyostatic syndrome. However, the localization of the tonus centers does not completely explain the nature of this syndrome. When the reactive organ, the muscle fiber, is considered it becomes evident that among other factors the colloidal condition of the sacroplasm plays a part in the maintenance of the tonus. The clinical aspects of the amyostatic symptom complex indicate that not only the sympathetic but under certain conditions also the parasympathetic plays a part in tonus regulation. The drugs generally used in the therapy of the tonus disturbances exert a paralyzing effect on the parasympathetic. Extracts of the root of belladonna have been found to have therapeutic advantages over pure alkaloids, and to explain this superiority of the root extracts it has been suggested that it contains associated substances not detectable by chemical analysis. It must also be considered that the alkaloids and the apo-alkaloids of belladonna root have a peripheral and a central point of action. The author thinks that the peripheral point of attack is not sufficiently considered in the pharmacotherapy of tonus disturbances. He describes the mode of administration of extract of belladonna root which is employed at his clinic and discusses the selection of cases, pointing out that he uses root extracts only in cases in which the amyostatic syndrome (rigor akinesia) predominates. He found extract of belladonna root particularly effective in posttraumatic akinesia and in the posttraumatic disturbances of the sympathetic regulation. The latter, like sympathetic symptoms that accompany chronic encephalitis, are the manifestation of a lesion of the brain stem.

Vestnik Khirurgii, Leningrad

80:443-552 (May) 1940. **Partial Index**

*Pathogenesis of Postoperative Pulmonary Complications. K. A. Shchukarev.—p. 443.
Rectal Narcosis with Barbiturates. N. I. Popkov.—p. 454.
Rupture of Liver. A. M. Patrik.—p. 457.
Mechanism and Symptoms of Subcutaneous Traumatic Rupture of the Spleen. A. N. Tairov.—p. 460.
*Arteriography in Obliterating Thrombo-Angiitis. E. G. Tetelbaum.—p. 464.
Bilateral Hip Dislocation. E. I. Tsvetkova.—p. 475.

Pathogenesis of Postoperative Pulmonary Complications.—Shchukarev presents an analysis of 600 instances of postoperative pulmonary complications. Seventy-five per cent of the operations were performed under local anesthesia. Inhalation anesthesia no longer appears to be a contributing cause. Pulmonary embolism is a rare occurrence after operation and has no relation to postoperative pneumonia. There were 15 cases of pulmonary embolism and 2 fatal instances of embolism of the main trunk of the pulmonary artery, a total incidence of 2.5 per cent. The concept of minute embolisms advanced by the American authors Wharton, Pearson, Cutler and Hunt is hypothetic and is not supported by facts. Late occurrence, blood in the sputum and onset with pleural pain are not characteristic of postoperative complications. Existing pulmonary lesions before the operation are not the determining factor for the great majority of the cases. Exogenous factors, such as grip epidemics, undoubtedly play a role. Bacteriologic study of the sputum in 67 cases revealed the presence of pneumococci in 58. In 41 these were of type IV. Coryllos, and Henschen of Switzerland, obtained much the same results. About 80 per cent of all postoperative pulmonary complications take place after abdominal operations. Certain alterations take place in the respiratory physiology following abdominal operations, namely interference with the diaphragmatic excursions, hypoventilation of the bases of the lungs, alteration of the bronchial tonus, lowering of the ciliary function of the bronchial epithelium, and suppression of cough. Interference with bronchial drainage results in retention of the secretions and of the bacteria. The respiratory tract of man contains in the normal state a mixed bacterial flora with the preponderance of the pneumococcus group IV. Infectious bronchitis plays the most important part in obstruction of the bronchi. The author regards atelectasis as a secondary result of bronchial obstruction and not the primary cause of pneumonia. The main factor in his opinion is defective bronchial drainage. The classic picture of massive collapse as described by Coryllos is not a frequent occurrence. Diffused bronchitis is the basis on which develop postoperative pulmonary complications. These take place most frequently in the right lower lobe. Roentgenologic studies of 47 patients before and after operation revealed a raised and immobile right diaphragm. The shift of the cardiac shadow to the involved side was observed in 6 cases; in only 1 case was the characteristic picture of massive collapse present. The mortality rate amounted to 5.9 per cent. Necropsy invariably revealed the typical picture of bronchitis and of focal bronchopneumonia of the lower segments of the lungs. Massive collapse was present in 1 of 52 necropsies. Respiratory exercises, inhalation of oxygen and use of morphine in the postoperative period are urged as prophylactic measures. Bronchoscopic aspiration as advocated by Jackson is the most rational measure in threatened massive collapse or threatened pneumonia.

Arteriography in Thrombo-Angiitis Obliterans.—Tetelbaum employed arteriography in 31 cases of obliterating thrombo-angiitis. The method permitted him to determine the degree of narrowing of the arterial lumen, the localization of the constriction and the state of the collaterals. The level of the thrombosing process and the degree of the development of the collateral circulation are best determined by arteriography. It makes it possible to substitute in some of the cases a sympathectomy for amputation. When amputation is indicated arteriography will, on the one hand, suggest a lower level and, on the other, it will prevent too low amputation. The author urges recourse to arteriography in cases of difficult differentiation between functional and organic disease of the blood vessels.

Nordisk Medicin, Gothenburg

7:1483-1526 (Sept. 7) 1940. **Partial Index**

*Sulfathiazole Treatment in Pneumonia: Blood Concentration and Elimination. A. R. Frisk.—p. 1483.
*Experiences Concerning Clinical Course and Later Power of Conception in 255 Cases of Extra-Uterine Pregnancy. J. Haffner.—p. 1488.

Sulfathiazole Treatment in Pneumonia.—Frisk reports 17 cases of acute pneumonia in which sulfathiazole was administered. There was prompt recovery without complications in 14, serous pleural effusion developed in 2 and 1 case was fatal. Toxis dermatitis occurred in 2 cases. There was no injury to blood or kidneys. Sulfathiazole is absorbed more rapidly and more completely than sulfapyridine. An initial dose of 4 Gm. is recommended, with 4 Gm. after four hours and then 1.5 Gm. every four hours until the temperature remains normal. An average concentration of 5.5 mg. per hundred cubic centimeters of total sulfathiazole and 4.5 mg. per hundred cubic centimeters of free sulfathiazole is thus maintained. This blood concentration gives the desired therapeutic effect. Nausea and vomiting are milder and less frequent than after sulfapyridine.

Extra-Uterine Pregnancy and Future Conception.—A follow-up of 255 cases convinced Haffner that the conservative procedure in operative treatment of extra-uterine pregnancy is justified. Although extra-uterine pregnancy recurred in 10.5 per cent of these cases, this was more than outweighed by the fact that later intra-uterine pregnancy occurred in 43 per cent. The mortality in operation for extra-uterine pregnancy is low and the danger of postoperative complications slight.

Book Notices

An Anatomical Analysis of Sports. By Gertrude Hawley, M.A. Cloth. Price, $3. Pp. 191, with 97 illustrations. New York: A. S. Barnes & Company, 1940.

This book has been prepared to fill a gap which in many cases seems to exist between the fundamental sciences offered to professional physical education students and the sports technic or methods courses which they study. It should give the prospective teachers and coaches of athletics a more definite idea of the parts which the sciences of anatomy, physiology, physics and chemistry should play in physical education. The author hopes that the book will provide an anatomic and physical basis for the selection of certain athletic "forms" such as the tennis strokes, hockey technic and diving, the adaptation of the athletic programs to individual needs and promotion of a better understanding of mechanical and physiologic factors underlying many of the injuries which occur in athletics. A chapter then takes up the functions of the various joints in detail and another one is devoted to muscular action. The rest of the book contains a detailed consideration of the various sports activities, as archery, baseball, basketball, tennis, equitation, field hockey, football, golf, swimming and diving, track athletics and winter sports. There is first a general description, then an analysis of the different motions, with a description of the muscles and joints used and the individual muscles involved. In the sports with which the authors are (a) unfamiliar, advice is given by an expert. Finally an appendix lists the different motions made in the body and limbs and the muscles involved in each motion. The book is well written and edited. The illustrations are clear, instructive and well done. This book should be recommended for the library of all those who coach or coach athletics or are interested in physical education.

Gynecological and Obstetrical Pathology with Clinical and Endocrine Relations. By Emil Novak, A.B., M.D., Dr.P.H., Associate in Gynecology, The Johns Hopkins Medical School, Baltimore, Md. Price, $7.50. Pp. 496, with 427 illustrations. Philadelphia & London: W. B. Saunders Company, 1940.

Emil Novak is America's best gleaner of the world's literature on gynecology particularly gynecologic pathology in its relation to clinical gynecology. He has devoted the major portion of his professional life to the Laboratory of Gynecological Pathology of Johns Hopkins Hospital and emphasizes his belief that the full import of the subject of gynecologic pathology can be imparted only by correlating it intimately with clinical gynecology. Novak's book justifies his belief; in presenting pathology with its clinical interpretation in mind he has created a textbook which is excellent for students, practitioners, specialists and pathologists. It might, however, emphasize that there are intricate details and unexplored fields beyond common knowledge. His book is excellent for the general pathologist but perhaps his preface might have left unsaid "for the pathologist in this particular field"; his sound and useful and meritorious work is severely adapted to impart knowledge to specialists in gynecologic pathology. The text is clear and comprehensive and contains most learned facts except for rare observations. Most of the microscopic illustrations are good and the reproductions are praiseworthy. The macroscopic pictures are taken largely from other books, but they have been well selected. Lesser flaws may be pointed out: Thus figure 36, supposedly the wall of a Gartner duct cyst of the vagina, presents a mucous epithelium, contrary to accepted belief and Novak's own teaching. Again, pseudoadenosis of hyperplasia of the endometrium do not warrant the appellation "tubal type of endometrium" (fig. 123). More important, the integration of clinical and laboratory pathology the author makes have added a particularly elegant feature of clinical moment had he discussed obstructed drainage from the uterus and its complications —hydrometra, pyometra and metaplasia of the endometrium. A survey of this excellent work would be inadequate, indeed, without directing special attention to the chapters on the endometrial cycle, carcinoma of the cervix and the ovarian tumors—the last named a special province in which Novak's own contributions are well known. More than passing comment is merited by

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An Introduction to Materia Medica and Pharmacology. By Hugh Allister McGuigan, Ph.D., M.D., Professor of Materia Medica, Pharmacology and Therapeutics, University of Illinois College of Medicine, Chicago, and Robert Allister McGuigan, M.D., C.M., with Elsie E. Krug, B.S., R.N., Science Instructor, St. Mary's School of Nursing, Rochester, Minn. Second edition. Cloth. Price, $2.50. Pp. 571, with 77 illustrations. St. Louis: C. V. Mosby Company, 1940.

The second edition of this textbook based on Brodie's "Materia Medica for Nurses" provides an introduction to materia medica and pharmacology which incorporates the recent advances in the subject. The opening chapter, by Elsie E. Krug, on the nurse's opportunities to learn pharmacology in the hospital ward lays down sound principles which could be read with profit by medical students as well. Users of this book will have difficulty arising from the arrangement of the subject matter and carelessness in the use of titles and subtitles, a circumstance which limits its value as a reference book. Alcohol, for example, is discussed under the chapter on drugs which act on the peripheral nerve endings. Although in general drugs are grouped in relation to the physiologic system with which they are most prominently associated, not infrequently the authors have failed to group together drugs having a common action; thus the main discussions of physostigmine, prostigmine and pilocarpine are scattered, and, when one attempts to locate acetylcholine, the index guides one to a brief mention of the substance in a section on plant hormones. In the chapter on drugs acting on the central nervous system, atropine is discussed under the subheading "Caffeine." The subject matter is broadly and adequately treated, and it will serve as a satisfactory introduction to an important field in the nurse's curriculum. Many students do not have the background to profit by so advanced a treatment, but to those who are equipped this textbook cannot fail to provide excellent insight into the essentials of pharmacology and materia medica.

Fetal and Neonatal Death: A Survey of the Incidence, Etiology, and Anatomic Manifestations of the Conditions Producing Death of the Fetus in Utero and the Infant in the Early Days of Life. By Edith L. Potter, M.D., Ph.D., Instructor in the Department of Obstetrics and Gynecology, The University of Chicago, Chicago, and Fred L. Adair, M.D., Professor and Chairman of the Department of Obstetrics and Gynecology, The University of Chicago. Cloth. Price, $1.50. Pp. 297, with 31 illustrations. Chicago: University of Chicago Press, 1940.

Programs to reduce infant mortality must take into account particularly the prevention of neonatal deaths. Studies thus far published indicate clearly that the factors responsible for neonatal deaths in many instances also contribute to fetal mortality. This book, which is a survey of the incidence, etiology and anatomic manifestations of the conditions producing death of the fetus in utero and the infant in the early days of life, should aid materially all those who are interested in the prevention of fetal and neonatal deaths. It contains descriptive material relative to the technic of necropsy of the fetus and newborn infant, statistics, means of prevention and particulars of investigations. The book is excellently prepared and may be highly recommended to all those interested in this field.

First Aid and Ambulance for Factories. Home Office Welfare Pamphlet No. 4. Fourth edition. Paper. Price 30 cents; 1s. Pp. 36 with illustrations. New York: British Library of Information; London: His Majesty's Stationery Office, 1940.

Occupiers of factories in Great Britain are instructed by means of this pamphlet about the makeup and location of first aid boxes, instruction of workers in first aid technic, construction and equipment of dispensary facilities in factories, the value of good accident records and the importance of setting up the system under medical guidance. Samples of forms used for recording accidents are included. The varying requirements of factories of various sizes are recognized, and suitable recommendations are made regarding necessary supplies and floor plans for the accident rooms.

Birth Control in a Midwestern City. By Regine K. Stix. Reprinted from the Milbank Memorial Fund Quarterly, Vol. XVII, No. 1, 2, and 4. January, April and October 1939. Paper. Various pagination, with illustrations. New York: Milbank Memorial Fund, [n. d.].

The author of the three papers reprinted by the Milbank Memorial Fund has made a careful analysis of data from the records in the files of the clinics for birth control operated under the direction of the Cincinnati Committee on Maternal Health. More than 90 per cent of the women had made some attempt to limit their families before their first visit to the clinic and the proportion of couples using contraception increased steadily as marriage lengthened. Before attending the clinic it was found that couples on relief had used contraception for less than 65 per cent of exposures, self-supporting manual workers 75 per cent of exposure and white collar workers more than 85 per cent. Pregnancy rates when contraception of some type was used were significantly lower than when none was used, but the differences were not great. Prior to admission to the clinic these rates were much lower following the use of the condom than after any other method of contraception. The preclinic contraception of those on relief was found to be ineffective, while that of those employed was relatively effective. Illegal abortion was most common among white collar workers, while spontaneous abortion was approximately the same in all groups. An occlusive rubber diaphragm and spermicidal jelly were prescribed for 98 per cent of the women who sought contraceptive advice. At the time of the follow-up only 40 per cent of those interviewed were still using this method of contraception, many having returned to the method used prior to visiting the clinic. It was estimated that all contraception, after clinic attendance, was 85 per cent effective in preventing pregnancies that would have been expected had contraception not been used. "The dominant factor associated with the acceptability of the contraceptives prescribed by the clinic was the degree of crowding in the home. . . . One third of the women who rejected the diaphragm and jelly gave as their reason the difficulty of returning to the clinic for new supplies. Nearly half of those who gave up the prescribed contraceptives did so because the diaphragm was uncomfortable, difficult to place, esthetically unacceptable or too much trouble to use. Only 9 per cent of the women who discarded the clinic prescription did so because of its failure to protect against pregnancy." This report with its numerous tables is fair in its conclusions and should be carefully studied by those who are interested in the problem of contraception.

Diabetes: Practical Suggestions for Doctor and Patient. By Edward L. Bortz, A.B., M.D., F.A.C.P., Associate Professor of Medicine, Graduate School of Medicine, University of Pennsylvania, Philadelphia. With a foreward by George Morris Piersol, B.S., M.D., F.A.C.P., Professor of Medicine, Graduate School of Medicine, University of Pennsylvania. Second edition. Fabrikoid. Price, $2.50. Pp. 296, with 16 illustrations. Philadelphia: F. A. Davis Company, 1940.

The second edition of this primer has been modernized after four years chiefly by a revision of the portions devoted to the actions and uses of insulin and protamine zinc insulin. In other respects it remains an expanded and somewhat more elaborate variation of the original edition.

Beginning with a simple, eloquent and straightforward discussion of the physiology of diabetes and nutrition suitable for lay consumption and comprehension, the text becomes somewhat involved and scientific, particularly in the sections devoted to diabetes in children and to acidosis. Those sections dealing with complications (pregnancy, surgery, dental care and care of the feet) are valuable. Detailed instructions as to insulin adjustment are sound and useful. The author's method of diet calculation and instruction, converting a quantitative system into one of household measures, seems complex in attempting simplicity. Practical hints by the dietitian concerning the marketing of food and its preparation, and recipes for palatable combinations is one of the most helpful in print. There is frequent repetition of identical material in various chapters contributed by different authors.

Undoubtedly there is a place for a primer for diabetic patients and this is a good one despite its relatively minor faults. For the patient in the author's practice, trained by his methods particularly as to diet, it serves as a valuable reference and expanded source of instruction. For the diabetic population at large, more scholarly and consistent primers are available and preferable. For the physician and student, more complete and detailed treatises on diabetes are essential.

One finishes a study of this volume with the feeling that if it had been designed for the patient alone it would have been more suitable. In its entirety it is too complex even for the intelligent layman and yet too incomplete for the average physician. It will probably remain a convenient reference book for the patients in the author's own practice, though much of it is not necessary nor easily understood by those patients.

Statistical Methods for Medical and Biological Students. By Gunnar Dahlberg, M.D., Ll.D., Professor at the University of Uppsala, Uppsala. Cloth. Price, $2.75. Pp. 222, with 13 illustrations. New York: Interscience Publishers, Inc.; London: George Allen & Unwin Ltd., 1940.

It seems strange that the last three years have witnessed the publication of so many books on statistical methods for the use of students of medicine and biology. The answer must be that a new need or at least a new recognition of an existing need has arisen. This book, compiled by the head of the Swedish State Institute for Human Genetics and Biology at Uppsala, Sweden, is announced in the preface as an attempt "to present statistical methods in a form calling for no special knowledge of mathematics" but at the same time to give an idea of the concepts on which these methods are based. Perhaps elementary mathematical knowledge is more extensive in Sweden than in this country, but unfortunately the average medical reader here will have great difficulty with most of the mathematical presentation. This book, in common with most others in the field, illustrates the great desirability of implementing scientific and medical educations with formal instruction on the use of the statistical method.

Tuberculosis and Genius. By Lewis J. Moorman, M.D. Cloth. Price, $2.50. Pp. 272, with 10 portraits. Chicago: University of Chicago Press, 1940.

Again and again physicians have given thought to the possibility that illness, such as tuberculosis or even dementia paralytica or starvation or some other physical factor, might stimulate mental activity or even be an important factor in the production of genius. There has been, for instance, evidence to show that a crippling handicap may serve as an important factor in the development of ambition. Indeed, articles have been published to indicate that allergic children are brighter than nonallergic. In this book Dr. Moorman discusses the effects of tuberculosis as they modified the lives of a number of extraordinary workers in the field of letters. Obviously, a similar study might be made in relation to art, architecture, medicine or some similar activity. There are some who insist that tuberculosis acts particularly as a stimulus to the brain in the case of writers and that it has some special effect on the imagination. It is not possible on the basis of Dr. Moorman's writings to answer the question positively. He is inclined to believe, however, that the effects are compensatory efforts on the part of the patient to meet the insistent demands of a dread disease, to defeat the annulling vision of approaching death and, in some, to disguise a consciousness of the dismal truth. His presentation of tuberculosis as a factor in the lives of such geniuses as Robert Louis Stevenson, Schiller, Shelley, Keats and Katherine Mansfield is a document of exceptional interest, beautifully printed by the University of Chicago Press and well worthy of a place in the library of every physician.

A Textbook of Laboratory Diagnosis with Clinical Applications for Practitioners and Students. By Edwin E. Osgood, M.A., M.D., Associate Professor of Medicine and Head of the Division of Experimental Medicine, University of Oregon Medical School, Portland. Third edition. Cloth. Price, $6. Pp. 676, with 37 illustrations. Philadelphia: Blakiston Company, 1940.

This is one of the better known and more complete general textbooks on laboratory diagnosis. It is particularly suitable to the need of the student or of the practitioner who needs an authoritative reference work for his infrequent departures from the simple basic laboratory routine. Dr. Osgood has been deprived by death of the collaboration of Howard D. Haskins, who collaborated in the first edition and to whom the present edition is dedicated. The spirit of the text is unchanged, however, and sixty-eight pages have been added. Of particular interest and potentially of great usefulness is a forty-six page

index by diseases. Here is an alphabetical list of diseases from abortion to yellow fever, with suggestions as to the proper laboratory work, when the condition is diagnosed or suspected, arranged in the order of significance. The author's interest is reflected in the section on hematology, which is the best one of the book. By the same token, the various discussions of the clinical application of laboratory methods to the diagnosis of syphilis are somewhat inadequately treated. There is an excellent general index and a working bibliography. The book is to be highly recommended.

Diagnostische Drüsenpunktion. Von Dr. R. Stahel, Assistent an der Medizinischen Poliklinik Zürich. Boards. Price, 7.80 marks. Pp. 66, with 30 illustrations. Leipzig: Georg Thieme, 1939.

While lymph gland puncture is not a new diagnostic procedure, few clinics employ the method as a routine and only a few published reports of the diagnostic possibilities have appeared in American literature. This concise monograph is an excellent survey of the subject. The author reviews the historical development of the procedure, its precise technic and method of staining of the cells, the advantages and disadvantages over biopsy, the cellular picture in puncture or aspiration of normal glands and the pathologic changes in disease. The text is beautifully illustrated with accurately reproduced photomicrographs of smears of puncture material in normal and pathologic conditions. The descriptive material is concise but adequate. At the end of the monograph is a plate of normal and pathologic cells in colors. The bibliography is carefully chosen and is pertinent. The material is carefully edited and the subject is presented with scholarly scientific restraint. The monograph will be of special interest to pathologists and hematologists.

The Treatment of Wound Shock (Instructions Produced in Co-Operation with the Army Medical Service). Medical Research Council: Committee on Traumatic Shock and on Blood Transfusion. War Memorandum No. 1. Paper. Price, 10 cents; 4d. Pp. 20, with illustrations. New York: British Library of Information; London: His Majesty's Stationery Office, 1940.

This short and excellent manual on the treatment of shock was prepared by the Medical Research Council in cooperation with the army medical service of Great Britain. In the eight pages of the text the mechanism, the clinical recognition and the treatment of wound shock are considered. A description of the treatment includes brief discussions of the relief of pain and restlessness, the combating of fatigue and cold, the arrest of hemorrhage and plasma loss, the restoration of the blood volume, the relief of dehydration and the administration of oxygen. There is a brief discussion of the substances which may be used for restoring the blood volume and it is concluded that human plasma and serum, because of superior keeping qualities, are more convenient than whole blood for use under field conditions. In addition the manual contains a supplement in fine type, and the following procedures are described and illustrated: (1) the army transfusion outfits and instructions, (2) the London and home counties blood transfusion outfit, (3) methods for continuous drip blood transfusions and intravenous infusion, (4) the reconstitution and administration of dried serum and plasma, (5) the administration of oxygen with the Boothby mask and (6) the composition of solutions.

Should Married Women Work? By Ruth Shallcross for the National Federation of Business and Professional Women's Clubs. Public Affairs Pamphlets No. 49. Paper. Price, 10 cents. Pp. 31, with illustrations. New York: Public Affairs Committee, Inc., 1940.

Married women have always worked. When the tasks moved to the factory and to the office, married women followed them. The depression greatly increased this movement. In 1890 one out of twenty-two married women worked outside the home, but in 1940 the rate is one out of five or six. Among the well-to-do women (who are the ones most opposed in objection to married workers) "there is a lower birth rate than among women in the low income brackets, many of whom are forced to work outside the home. . . .

"High infant mortality rates occur most frequently among working mothers in low-income levels where the birth rate is also high and where married women are forced to do their own housework as well as do hard work in factories or in domestic service. . . .

"Thus the babies whose mothers were employed away from home beginning when the baby was less than 2 months old had a mortality three times the average, and those whose mothers began such work when the baby was between 2 and 9 months old had a mortality about twice the average."

Pseudo-Isochromatic Plates for Testing Color Perception. Cloth. Price, $9. 46 Plates. Southbridge Massachusetts: American Optical Company, 1940.

This consists of a paneled folder containing forty-six charts of the general type devised by Ishihara but presenting many improvements, evident only after a comparative test on the same subjects. The panels are not numbered and are so arranged that any desired pair may be exhibited alone and in any order. These provisions will facilitate the detection of malingerers. Inserted in a pocket in the folder, which is of substantial construction, is a pamphlet giving a brief discussion of color blindness, description of types, and instructions for making the tests and interpreting the results. There is also a brief bibliography and a tabular key for interpreting each plate. Most of the plates are applicable only to red-green defects, but there are several especially designed for the detection of blue-yellow defects. On the whole the equipment makes possible a somewhat more comprehensive examination but the technic is greatly simplified as compared to some of the other devices that have been used.

Manual of Fractures, Dislocations and Epiphyseal Separations. By Harry C. W. B. de Brun, M.D., F.A.C.S., Adjunct Professor of Surgery, New York Polyclinic Medical School and Hospital, New York. Cloth. Price, $3. Pp. 468, with 150 illustrations. Chicago: Year Book Publishers, Inc., 1939.

For any surgeon who has to deal either occasionally or often with traumatic practice, this manual offers a clear, concise outline of the various methods used for the particular injury encountered. Its descriptions are briefly and intelligently stated, yet the work is detailed enough to be comprehensible. The author, who has had a long and varied experience in fracture surgery, does not leave the reader wanting for the method which is most likely to succeed. One is able to find without difficulty the described method which the author has found to be most useful in his own practice. The book itself is divided into four parts. Part I considers the treatment of fractures from a general point of view, discussing emergency and eventual treatment. Part II deals with specific fractures, including fractures of the face and the epiphysial separations. Part III discusses dislocations, while part IV offers significant adjunctive procedures to be followed in this important and modern branch of surgery. The author is to be congratulated on obtaining the services of Dr. Richard Kovacs in the chapter on physical therapy and those of Dr. Morris Kaplan in the chapter on roentgenology. The little book is well worth the investment.

El libro del hospital moderno. Compilado y editado con el fin de servir a médicos, cirujanos, administradores y demás personal facultativo y directivo de hospitales. Edición de 1940-41. Board. Price, $2.50. Pp. 420, with illustrations. Chicago: Modern Hospital Publishing Co., Inc., 1940.

First edition 1940-1941 written entirely in Spanish, it is modeled after the Modern Hospital Yearbook, to which it is similar in content and arrangement. This work is intended for use in the Latin American countries. It contains 160 pages of hospital information and suggestions and 264 pages of advertising.

Principles of Orthopedic Surgery. By James Warren Sever, M.D., Assistant Professor of Orthopedic Surgery, Harvard Medical School, Boston. Third edition. Fabrikoid. Price, $3.25. Pp. 418, with 224 illustrations. New York: Macmillan Company, 1940.

Dr. Sever has thoroughly revised his concise volume covering all phases of orthopedic surgery. It is well written in a clear, direct manner and is illustrated with numerous photographs and drawings of classic pathologic entities. His discussions of diagnosis are to the point. Treatment is presented with conservatism and operative methods are in good balance. Although this book will hardly serve as a reference book for the operating orthopedic surgeon, it will be of great usefulness to the pediatrician especially and to medical students and nurses in this field of surgery.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

DERMATITIS IN FRUIT HANDLERS

To the Editor:—In a large orchard it is the custom to pick all the apples on the tree, the poorer grades being peeled, cored and sliced, then dried. These apples have been sprayed with lead arsenate spray (0.375 per cent) three times. After being picked, all apples are washed in soapy water, silicate solution, hydrochloric acid solution and twice in cold water. They then come out on a table and are sorted. The bruised and partly spoiled apples are used to make dried apples. These apples come down a chute, are picked up by the operator and thrust on a machine which peels the apple and cores it. This is piece work. These workers are exposed to apple juice ten hours a day and frequently cut themselves on the sharp knives. The skin irritation and small cuts are painted and exceedingly slow in healing and are described as intractable. Because of the moving parts the wearing of any type of glove would be dangerous. Neither E. Premer White nor Schwartz and Tulipan give any suggestion for treatment or prevention in their books. I would appreciate any information you can give me with regard to prevention or treatment.

M.D., Idaho.

ANSWER.—Dermatitis is quite common among workers handling fresh fruits and vegetables of any kind. It seems to be caused by maceration of the skin from continuous exposure to the juices as well as by the irritating action of the juices on the skin. In the large canneries in California the workers exposed to these juices wear rubber gloves, and although they work around machinery and moving knives these are so safeguarded that accidents from the gloves being caught in the machinery are exceedingly rare. Close fitting rubber gloves reaching well above the wrist, over which are worn sleeves of an impermeable material such as described by Schwartz, Warren and Goldman (Clothing for Protection Against Occupational Skin Irritants, *Pub. Health Rep.* **55**:1158 [June 28] 1940) would prevent the juices from coming in contact with the skin. A long apron made of similar material would prevent the juices from soiling the clothes.

If the workers object to the rubber gloves being worn next to the skin, there are now available on the market rubber gloves which are fabric lined.

If the dermatitis is severe, the treatment consists in removing the patient from work and applying mild lotions or ointments, depending on the type of dermatitis present. Lotions should be applied to the oozing, vesicular types of dermatitis and ointments to the drier types. Lotions suggested are boric acid, calamine and tannic acid from 2 to 5 per cent; ointments suggested are boric acid, Lassar's paste and zinc oxide.

Those workers having mild cases of dermatitis should be given mild ointments to apply to the parts affected and protective clothing such as sleeves and gloves and allowed to continue work while under treatment. They often recover under this type of treatment and after recovery do not usually have any recurrences. In "Skin Hazards in American Industry, Part III," U. S. Public Health Bulletin 249, page 9, appears a description of dermatitis preventive measures in canning plants, which will also apply to the case in question. See also Schwartz, Louis: Cutaneous Hazards in the Citrus Fruit Industry, *Arch. Dermat. & Syph.* **37**:631 (April) 1938.

HYPERTENSION IN FAMILY GROUP

To the Editor:—Recently I treated a man aged 42 who had had high blood pressure for at least fourteen years. His blood pressure was over 300 systolic, his heart was enlarged, his kidneys were affected and he suffered severely from headaches and dyspnea. He developed generalized edema and died. The deaths of two of his brothers, his father and one of his mother's brothers were similar and all died young. He has five children, the eldest aged 15. I have found out since I treated this man that the three boys of his five children already have hypertension. Their ages are 7, 12 and 15, and all have blood pressures over 150 systolic; one is 175. All have albumin in their urine and all have dyspnea on exertion and frequent headaches. What can be done for these children?

L. A. Crowell, Jr., M.D., Lincolnton, N. C.

ANSWER.—One rarely observes such a striking example of the familial factor in the etiology of hypertensive arterial disease as that revealed by the family described. Though it is extremely difficult to differentiate clearly those influences which are purely hereditary in the biologic sense (defective germ plasma) and those which arise from familial environment in childhood, it is most important to attempt an evaluation of the relative importance of the two sets of factors. The hereditary transmission of a high degree of vulnerability of the vascular apparatus of these children is irrevocable; there is nothing one can do about it. Etiologic factors acquired postnatally through environmental exposure may be amenable to correction. Dietary habits, emotional characteristics and habits of hygiene are acquired in early childhood through imitation of parents. These may sometimes be altered.

In trying to differentiate the etiologic factors in the present problem it would be useful to know something of the family history as regards hypertension on the maternal side. Should hypertensive disease be prominent there also, the prognosis for these children would be distinctly darkened. Careful inventory of their habits of life is desirable; the abuse of condiments, habitually inadequate fluid intake, habits involving insufficiency of sleep and mental attitudes of excessive apprehension are characteristics tending to provoke hypertension in vulnerable individuals. Of great importance is the question of possible familial transmission of infection with organisms showing tissue specificity for the renal parenchyma. This appears not unlikely in view of the evidences of renal injury in the children and their father. Instances of familial nephritis, transmitted through upper respiratory tract infection with streptococci are not unusual, especially if careful search is made. Rheumatic heart disease likewise is not unusual in several members of a family and over several generations; the organisms causing the tonsillitis in the parents sooner or later are likely to cause a similar infection in the children.

An excellent summary of the modern treatment of hypertension is given by Stroud (The Diagnosis and Treatment of Cardiovascular Disease, Philadelphia, F. A. Davis Company, 1940). The renal functional capacity of these children should be carefully evaluated. Probably therapy directed toward improvement of the renal function would be more effective than any other. One most frequently neglected aspect of treatment is the anemia so common in severe hypertension with or without nephritis. The pallor, headaches and undue dyspnea mentioned suggest that anemia may be a prominent feature. At best the outlook for these children is doubtful.

EFFECT OF RADON SEEDS FOR URETHRAL CARUNCLE

To the Editor:—Have radon seeds ever been known to produce burns and scar tissue after therapeutic use for a urethral caruncle in women? Is it likely that an atresia of the vagina could result from such treatment assuming that the seeds were prepared by a reputable firm and the technic was well performed?

M.D., Pennsylvania.

ANSWER.—The formation of some scar tissue after the therapeutic use of radon seeds is unavoidable. Burns have occurred following the use of radon seeds when the technic has not been absolutely correct. In this connection it is important to distinguish between intense radiation effects and actual burns. It would be difficult to explain an atresia of the vagina as a result of a correct irradiation of a urethral caruncle with radon seeds.

TREATMENT OF VENEREAL WARTS

To the Editor:—A woman aged 21, pregnant since January, acquired a vaginal infection. Later severe venereal warts developed. They are of the cauliflower type and are extensive and irritating to the external labia. The Wassermann reaction is negative. Smears have been negative for gonococci. However, the husband gives a history of past gonococcic infection. Many forms of treatment have been tried without any success including mild protein silver, silver nitrate, mercurochrome, merthiolate, silver picrate, potassium permanganate, mercury bichloride douches and soda douches. Is there any treatment for such a condition other than those mentioned? Would small doses of x-rays be indicated and safe? Would ultraviolet exposure be useful? This girl is in constant irritation and some kind of treatment should give relief.

M.D., Iowa.

ANSWER.—The cause of verruca acuminata, or so-called irritation of venereal warts, may be due to either gonorrheal or nongonorrheal infection. The warts are prone to be much more profuse during the period of pregnancy.

Any treatment by the use of local antiseptics is bound to fail as long as the mechanical presence of the irritating masses remains. Therefore the first step in the proper management of such cases is to remove the warts by surgery, which may be done with the knife or with a cutting current. Regardless of how removed, the base must be treated by electrocoagulation. Small warts are best removed by complete electrocoagulation without preliminary surgical removal.

Following removal by this method, local antiseptic douches will have a reasonable chance to clear up the local infection, which is the primary cause of the verrucae. Moderate doses of sulfanilamide by mouth may be of value in helping to control the infection and in preventing recurrence of the warts.

SUPPRESSION OF LACTATION IN SCARRED BREASTS

To the Editor:—A woman aged 22 suffered a severe burn at the age of 4. The scar tissue extends from the umbilicus to the chin. She is now approximately seven months pregnant. The nipples are entirely destroyed and the breasts completely covered with scar tissue. What care would you suggest for the breasts and at what time should it be instituted?

D. K. Matthews, M.D., Brandon, Ohio.

ANSWER.—Treatment should be directed toward drying up the breasts immediately after delivery. The present method consists in the application of a tight binder to both breasts and the use of ice. The intake of fluids can be limited moderately. This regimen will limit the engorgement of the breasts, which should completely subside in seventy-two hours.

Estrogens in large doses may prevent lactation when administered during the first few days of the puerperium. The new synthetic estrogenic drugs derived from stilbene have been used experimentally for this purpose with considerable success. They are not commercially available. If a patient receives 5 mg. of stilbestrol by mouth daily no engorgement takes place, the breasts remaining soft and flaccid. The medication is usually continued for about a week. Since stilbestrol is not available, 5 mg. of estrone daily may be administered for a similar time. Some investigators have reported success in suppressing lactation by administering from 50 to 150 mg. of testosterone propionate over a period of two or three days. The endocrine therapy of this condition is obviously quite expensive at present. As is usual in estrogenic therapy, care must be exercised in its administration.

PRIMARY OR METASTATIC OVARIAN CARCINOMA

To the Editor:—A white woman aged 41, a secundipara, was being treated for varicose veins. About two days after her last injection she suddenly experienced sharp lancinating pains in the lower part of the abdomen and collapsed. I was told that examination revealed rigidity, rebound and tenderness over the lower left quadrant and slight elevation of temperature. Vaginal examination revealed a sensation of mass in the left fornix. A diagnosis of pelvic inflammatory disease was made. After a few weeks of conservative therapy the patient was reexamined and a diagnosis of left ovarian cyst was made. Three weeks later, on entering the abdomen, I found some serosanguineous fluid in the pelvis. The left ovary was about 3½ inches in diameter, mainly cystic. The cystic portion ruptured during the operative procedure. There was some doubt as to the pathologic diagnosis. The right ovary appeared normal in size, shape and consistency. A left salpingectomy was done. Ten days later the pathologist's report was papillary cystadenocarcinoma of the ovary. High voltage roentgen therapy was instituted soon after her discharge from the hospital. Should the patient be operated on again for removal of the right ovary? Should the uterus be removed at the same time? Is it sufficient to inactivate the remaining ovary by roentgen therapy and keep the patient under observation?

M.D., New York.

ANSWER.—If the patient really has a carcinoma of the ovary, radiation therapy will not suffice to insure a cure. Recourse to reoperation is the procedure of choice, but first the pathologic specimen should be reviewed not only to make certain of the diagnosis but in search for evidence suggestive of a metastatic growth rather than a primary ovarian cancer.

At the time of reoperation the upper abdominal viscera should be palpated for a primary growth and the pelvis should be surveyed critically for evidence of extension; this pertains particularly to the affected side. If there is local extension, a unilateral radical procedure with exposure of the ureter may be indicated. In any event the remaining ovary should be removed together with the body of the uterus. Authorities differ as to whether complete removal is preferable to a supravaginal hysterectomy. It is agreed that the uterus should be opened immediately on removal, for the body of the uterus may be the site of a primary growth which extends to the ovary.

INTRAOCULAR FOREIGN BODY

To the Editor:—A man about 47 years old was struck in the right eye by a piece of brass several millimeters in diameter. As a result of this accident he now has an intra-ocular foreign body and a large corneal scar. Otherwise the eye is normal, although no sight is present because of scar. 1. What are the chances of extrusion or removal of the foreign body? 2. What are the chances of a successful corneal transplant? 3. What are the chances of sympathetic ophthalmia? 4. Has maximum improvement taken place or may further improvement be expected either through any operation or through extrusion of the foreign body? 5. Should the eye be removed at this time?

M.D., Connecticut.

ANSWER.—1. The chances of extrusion spontaneously of the foreign body are nil. The possibilities of operative removal depend entirely on the location of the body, the condition of the eye and the skill of the operator.

2. There is no sense in even attempting a corneal transplant as long as there is a foreign body within the eye. After that is removed, the possibilities of a transplant may be considered and depend on how much normal corneal tissue remains.

3. There are considerable chances.

4. With the meager details at hand, it is impossible to answer this question.

5. Again the answer depends on the condition of the eye, the length of time the foreign body has been present, the duration and character of whatever inflammation may be present, and the judgment of the ophthalmic surgeon, based on experience with similar cases.

GALACTOCELE

To the Editor:—A nursing mother complained of pain, tenderness and a feeling of engorgement in one breast, the symptoms becoming progressively worse over a period of about five days. Examination revealed the entire lower quadrant of the breast to be red, tender, hard and engorged, and warm to the touch. The rest of the breast was soft and normal. A breast abscess was strongly suspected and I was about to treat her for it when she pointed out to me a tiny vesicle on the nipple. This was in the lower part of the nipple and to all intents and purposes looked just like a small 2 mm. vesicle. Partly on suspicion and partly for lack of something better to do I opened this small vesicle with a scalpel. Following a tiny incision, milk gushed out in a steady stream under considerable pressure and all the symptoms disappeared. The same condition has occurred again about three times in the same breast and once in the other. I realize that one of the main milk ducts is being blocked but the obstruction is not a caking of milk but an actual overgrowth of epithelium over the duct opening. The skin which obstructs the duct is white in appearance and bulges from pressure of the milk but still seems to require incision, after which the breast is all right for a week to ten days. I have never seen or heard of such a condition. A prominent obstetrician told me that he had never heard of such a thing but advised taking the baby off the breast rather than risk a breast abscess which might follow incision.

M.D., Pennsylvania.

ANSWER.—Each breast is made up of from fifteen to twenty-four lobules arranged radially. The secreting acini of each lobule are connected by small ducts which unite to form a lactiferous duct, the opening of which can be distinguished as a minute orifice in the nipple. Undoubtedly the tiny vesicle which is described represents the closure of such an orifice and the resultant distention of the duct.

The collection of milk in the duct system of a lobule usually produces a reddened, tender, fluctuant enlargement at the base of the nipple and is known as a galactocele. In the case described the distention of the duct system must have extended downward to involve the entire collecting ducts of an entire lobule, so that this lobule became reddened and swollen. Except for the lack of acute symptoms, these tender areas resemble abscesses of the breast.

Repeated incision of the lactiferous duct is likely to lead to infection. It is probably wiser to consider drying up the breast than to risk possible complications.

EXCESSIVE IRON IN WATER SUPPLY

To the Editor:—A condition has arisen in the Central School about which I should like to have your opinion. The water taken from wells is heavily impregnated with iron salts. To overcome this condition a chemical with the trade name "Ahopal," made by the North American Fiber Products Company of Cleveland, has been used. I understand from the engineer that this is satisfactory in the boilers but the rusty looking water if left in the bowls causes a brownish and discolorizing and not only corrosion but corrodes the pipes, particularly at the joints. Information from the manufacturers advises us to put 1: 1,000,000 of this liquid in the water system to overcome this difficulty. This, of course, would include the drinking fountains. I should like to know whether this would be in any way harmful, especially if used continuously. The only alternative I see is replacement of the pipes when they fill with the reddish material or when they leak through corrosion. The water has been tested and found satisfactory for human consumption.

M.D., New York.

ANSWER.—On the basis of the information given it is not possible to give a satisfactory answer to the inquiry. Under the conditions cited it seems probable that the water supply from the school well not only contains excessive iron but may also have a low hydrogen ion value which makes it corrosive to pipe material and causes the staining of fixtures reported.

The use of chemicals to treat water for boiler purposes is often desirable, but it is generally unwise to use the same water for drinking purposes especially when specific information is not available concerning the chemical compound used, other than its trade name.

A physician should recommend to the school board that it employ the services of a competent water chemist to investigate the problem and give expert advice.

PAINFUL, TENDER FINGERS IN PREGNANCY

To the Editor:—A primipara about a month from term has been having some swelling and tenderness of her hands which is unlike anything in my experience. It started about three weeks ago with swelling and tenderness, especially of the ends of the fingers. The thumb, the index and middle fingers and the medial aspect of the ring finger (nerve distribution). There was some pain in the same areas but it has been controlled. The patient is passing more than a quart of urine a day which is normal in color, specific gravity 1.014, reaction slightly acid. There is no albumin, with either Heller's or the Esbach and cystic acid tests. There is no sugar. The blood pressure is 115 systolic, 55 diastolic. The pulse is 82. At first the trouble was in the right fingers and was worse when the patient got up in the morning. Gradually it wore off till she felt much better in the afternoon. There was no edema of the ankles and only a little of the face. The patient's vision is normal. About two weeks ago the other hand became affected also. The swelling and edema of the fingers persist all day now. The ends of the fingers are so sore and tender that the patient can hardly wash her dishes. Now there is some swelling of the ankles and of the face. At first I tried having her take two yeast cakes a day but that caused no improvement, so I did not pursue the vitamins further. Then I gave her half a grain (0.03 Gm.) of phenobarbital three times a day. That stopped the pain but did not affect the tenderness or swelling. I have had her rub the fingers and hands toward the body and hold the hands up supported on pillows. That gives some relief. What can I do to relieve this patient? She is having only an occasional light headache.

Purvis S. Robbins, M.D., Bradford, Pa.

ANSWER.—From the data presented it seems impossible to classify this condition properly. The distribution of the pain corresponds to the sensory distribution of the median nerve but it seems highly improbable that there should be disease of the two median nerves at the same time. Bilateral cervical rib would seem incapable of producing pressure on these fibers alone. There seems to be no good reason for a peripheral neuritis. The common causes for this condition are alcohol, arsenic and lead, and even these should have a more general distribution.

The symmetric character of the pain suggests Raynaud's disease but the physical examination does not seem to support this diagnosis.

A moderately severe hypothyroidism should be considered. This often appears first as puffiness about the hands and wrists and is frequently associated with tingling but seldom with acute pain. Hypothyroidism occasionally appears during pregnancy. A basal metabolism determination would be helpful.

The neuritis of a vitamin deficiency is an attractive diagnosis but seems difficult to support. If there is lack of vitamin B_1 the therapy must be more vigorous than the administration of two yeast cakes daily. Full doses of thiamine hydrochloride must be used over a considerable period.

It would be helpful to know whether motor phenomena exist as well as the sensory ones.

PERSISTENT FEVER IN INFECTIOUS MONONUCLEOSIS

To the Editor:—My grandson, aged 5, about nine weeks ago acquired a mild sore and throat infection and had a few enlarged cervical glands. He had a fever of about a degree, and after several weeks a diagnosis of acute mononucleosis was made. This was confirmed by the heterophil blood test as well as by blood counts and blood smears. The patient has had a persistent fever varying from 0.6 or 0.8 degree to sometimes as high as 1.5 degrees. During the past six weeks he has been kept in bed most of the time and his fever still persists, although not as high as when he is active. There are absolutely no other recognizable signs. He has an enlarged spleen, his tonsils are apparently normal and reenlargement of the gland also appear to be normal. He seems pretty well and has gained weight, although he does seem to fatigue rather easily. Several competent pediatricians have seen him and assure me that he will get well but they know of nothing to do to hasten the recovery, particularly to terminate the fever. Whatever literature I have been able to find on the subject states that the fever usually persists three or four weeks and that the disease is self limited. Many of us if there are any other measures to be adopted and also whether it is uncommon for this condition in a child to persist with fever for a period of eight or nine weeks. If you have other suggestions to offer, I should be pleased to know them. Is sulfanilamide of any value in this condition?

M.D., Wisconsin.

ANSWER.—Although the fever in infectious mononucleosis usually lasts for from three to four weeks, it is not uncommon for it to last longer. There are cases in which as much as a degree of fever was present for over three months. In one case, a few tenths of a degree was intermittently present for six months. Certainly a few patients have a prolonged convalescence with a considerable disability for many months. No effective treatment is known. Sulfanilamide is probably without value. Occasionally arsenic in the form of solution of potassium arsenite given to tolerance for two to three weeks appears to be of value. General measures such as an adequate diet and vitamin intake should be observed. The patient should be kept relatively quiet.

POSSIBLE ENCEPHALITIS FROM ANTISYPHILITIC ARSENICAL THERAPY

To the Editor:—A man on whom the diagnosis of primary syphilis was made showed typical spirochetes on darkfield examination. On Sept. 17, 1940, he was given 0.45 Gm. of neoarsphenamine and 0.2 Gm. of a bismuth compound. On September 24 he was given 0.6 Gm. of neoarsphenamine and 0.2 Gm. of the bismuth compound. On September 26 he started showing some early symptoms of encephalitis: marked irritability, apprehension and increased deep reflexes. On September 28 he became unconscious and remained so for about one week. The spinal fluid showed no change except increased pressure. He showed no other symptoms except those of an encephalitis. He has responded well to therapy and is now recovered. The problem now is how to treat his syphilis. Should any arsenical preparation be given?

M.D., Kentucky.

ANSWER.—The symptoms mentioned are suggestive of hemorrhagic encephalitis. Nothing is said about opisthotonos. It could not have been due to syphilis without a great increase in the cell count and without a positive Wassermann and flocculation test on the fluid. Such hemorrhagic encephalitis usually comes on early in the course of syphilis. One would not consider the use of arsenicals in the future under any circumstances. In a situation like this it is necessary to employ bismuth therapy. Of course that would be impossible if one were to use an insoluble preparation. On that account it would be preferable to give an injection twice a week of one of the soluble salts, and iodobismitol with saligenin might be tried. It has been shown that a biweekly intramuscular injection of iodobismitol gives a sustained excretion curve of bismuth in the urine that is high enough to indicate a satisfactory therapeutic level of bismuth in the blood stream. Naturally the patient should be watched for evidence of irritation of the kidneys and for any evidence of mucous membrane irritation around the teeth. It is probably safe to carry on such therapy for months. A specimen of blood should be taken every three months and the treatment kept up until the serologic tests have been negative for one year.

FATIGUE IN FIRE FIGHTERS

To the Editor:—The local forestry department has asked me several questions which I would like to refer to you. We have numerous forest fires in this section during the summer and as the altitude is high (5,000 to 8,000 feet) the fire fighters tire easily and the number of man-hours is cut down considerably. They were interested in getting something in the nature of a stimulant that would help them man to last longer in their work. The forestry department thought about having the men inhale pure oxygen from time to time. Do you think that it would relieve fatigue enough to justify its use? Can you make any suggestions along this line?

Herbert J. Schwartz, M.D., Challis, Ida.

ANSWER.—It is not likely that, at an altitude not exceeding 8,000 feet above seat level, anoxemia is the main factor of excessive fatigue in men fighting forest fires, provided the density and other character of the smoke do not significantly interfere with the breathing. At any rate, a five to ten minute rest in the horizontal position every hour will probably do as much as inhalation of oxygen in overcoming the "oxygen debt" developed by the intense physical exertion, and the workmen would have to cease labor in any event during the oxygen administration. Men fighting forest fires probably do more intense physical labor for longer hours than is the case in most types of ordinary physical work. Hence more rapid onset and more severe fatigue is to be expected. But if the fire fighters are also exposed to excessive heat for many hours, one must think of excessive sweating, desiccation of tissues and loss of blood and tissue chlorides. It has been abundantly shown that tablets of table salt and ample intake of water are of real value in the prevention of fatigue under such conditions. Excessive physical exertion calls for an abundance of food. If the fire fighters' meals are further apart than three to four hours sugar, in the form of candy, between meals, will undoubtedly help to delay or minimize fatigue. Sodium chloride tablets and candy are simple matters to handle, even under conditions of fighting forest fires in the Rocky Mountains. One must also bear in mind that, in the case of extensive forest fires, many persons may be drafted as fire fighters who are not by daily physical work conditioned to extreme and sustained physical exertion. Some twenty-five years ago tests with sodium phosphate given by mouth were made on soldiers in Europe, with apparent good results in reducing fatigue. The biochemical basis for this therapy is now questionable, and the fact itself is as yet so much in dispute that one cannot promise any value of a few grams of inorganic phosphate by mouth for the fire fighters. But short and frequent periods of complete rest, water, sodium chloride and candy should prove helpful.

PROBABLE PEMPHIGUS VEGETANS

To the Editor:—An obese white woman in her fifties has for two years had sores on her tongue, buccal mucosa and lips. For one year she has had an eruption in the groin. The oral lesions are marked by large vesicles on the lips which break, crust and finally leave a raw surface which bleeds readily. The margins of the tongue are raw and tender and show digitations as though in contact with teeth (although the patient is edentulous). The surface of the tongue is not remarkable. The buccal mucosa is covered with scattered white vesicles and tiny raw areas, the first evidently resulting in the second. There is some thinning of the lips and a pinched appearance of the angles of the mouth but no true fissuring and no exudation or hemorrhage. This condition has been treated by others with a multitude of antiseptics, which included sodium perborate and most recently gentian violet, to no avail. The inguinal lesions began as a small papule on the genitalia, which was soon followed by raw areas in the perineum, in the groins especially on contact surfaces, in the anal folds, under the breasts and, as the patient believes, in the axillas. These are painless weeping granulomas covered by thin epithelium having the cytologic appearance of hemorrhoids but feeling firm to the touch. They are irregular, and are largely discrete with normal skin intervening. They tend to vesiculate and then weep a watery fluid, leaving a raw surface which then seems to epithelize. Under the breasts there are visible fine dissections in the skin which suggest, the patient says, bites of lesions similar to those described. There is no noteworthy lymphadenopathy and there are no sinuses. The blood Kline and Mazzini tests are negative, as is the Frei test. A smear of the oral lesions is negative for Donovan bodies. The formol-gel test is not indicative of granuloma inguinale. A biopsy has not been feasible. Massive oral doses of vitamin C complex yielding about 1 mg. of riboflavin daily plus a parenteral thiamine hydrochloride given for one week simultaneously with the administration of sulfathiazole 40 Gm. daily for the week have had no beneficial effect. The patient is now receiving feedin in the belief that she has granuloma inguinale despite the lack of confirmatory evidence. What suggestions as to diagnosis and procedure can you offer?

M.D., Indiana.

Answer.—One might keep in mind the possibility of a deficiency disease, particularly vitamin B complex, but as there has been no response of the lesions around the mouth with this type of therapy it may be eliminated. From the description it is not easy to get a picture of the whole process, but it sounds most like a chronic type of pemphigus, though ordinarily the pemphigus vegetans type of the disease is more rapid and leads to a fatal termination. The blood picture should be studied carefully to eliminate lymphoblastoma; the blood sugar should also be examined. As pemphigus vegetans is a grave disease, consultation with a competent dermatologist who would help to share the responsibility would be advisable.

EFFECTS OF HIGH HEELED SHOES

To the Editor:—When I see women walking with the modern high heeled shoes I often wonder if they could cause some of the symptoms which arise in women which are hard to explain. Of course I can understand the effect it might have on the lower limbs but it does to me that the equilibrium of the body might be disturbed. Can they cause a malposition of the pelvis or spine? Can they cause any disorder in the pelvic organs? Do the small bottoms of these long heels cause a tendency to turn over and this constant fear of turning over while walking cause nervousness or vertigo?

M.D., Pennsylvania.

Answer.—The high heeled shoe may cause an increased lumbar lordosis and a pelvic tilt. In young women this amount of tilt can be compensated for readily. In older women or people with arthritic changes this alteration of position may cause a strain and backache. It is hardly conceivable that any abnormality of the pelvic organs could be attributed to high heeled shoes. It is doubted that the instability of the high heel and small weight bearing surface cause sufficient strain to account for any nervousness or vertigo. It is true, however, that women who walk in high heeled shoes with small weight bearing surfaces may have an altered gait and an altered posture. This altered posture when associated with fatigue and visceroptosis may be a factor in vasomotor disturbance.

COOKING METHODS AND VITAMIN PRESERVATION

To the Editor:—Will you please let me know whether vitamins are conserved or destroyed in the use of the rapid pressure cooker and in the use of the slow heat fireless cooker. It would be contemplated that both meats and vegetables be cooked in these cookers if there is no appreciable loss of vitamins.

Lucius F. Horz, M.D., New York.

Answer.—The smallest possible loss of vitamin C occurs when vegetables are cooked in the new style pressure cookers which operate under a small amount of pressure. When vegetables are boiled in water, from 15 to 30 per cent of the vitamin C is transferred from the vegetable to the cooking water and 15 per cent of the vitamin is destroyed by oxidation (McIntosh, Jennie A.; Tressler, D. K., and Fenton, Faith: The Effect of Different Cooking Methods on the Vitamin C Content of Vegetables, *J. Home Econ.* **32**:692 [Dec.] 1940).

The use of a slow heat fireless cooker cannot be expected to retain as much vitamin C as the rapid pressure cooker because there appears to be an enzyme present in vegetables which rapidly changes vitamin C to another substance that has no antiscorbutic properties. This action is prevented by heat.

According to recent experimental work the best way to cook meat for conservation of vitamin B_1 is to broil or fry it as quickly as possible. Long cooking processes, such as roasting or stewing, destroy about 50 per cent and long frying destroys 40 per cent of the vitamin B_1 content of meats.

CLOSURE OF DRUM MEMBRANE PERFORATIONS

To the Editor:—What is the best medication to hasten the closure of a perforation in the ear drum? The patient in question was seen by a physician on Sept. 30, 1940, who reported "acute otitis media with a slight discharge through a small perforation of the right drum." On October 22 the same doctor examined the ear again and reported "no discharge. The perforation is closed and the only signs of previous inflammation are two to three small blood vessels passing to the border junction of the drum and canal, not only with high magnification but using light." A day or two ago I examined the drum and saw two perforations, one in the posterior half about 2 mm. in diameter and a small one almost closed in the anterior half. There has no discharge and no sign of inflammation. The patient has no pain or discomfort and his hearing is only slightly impaired. He has been using phenol and glycerin drops for the former, daily, on the advice of his physician. The patient has been in the army an active duty but was relieved when this condition was discovered. He is of course doubly anxious to get the perforation closed for this reason. The history of his otitis goes back many years, when he was boxing as a boy and injured his ear and shortly after went in swimming, following which he had severe otalgia for some time. Around September of this year he began having pain again and a discharge began the 3d. Sulfathiazole was used and the discharge stopped five days later. Around September 12 the discharge began again. This time the canal was irrigated with boric acid and swabbed out with silver nitrate. About the 10th the draining ceased again but resumed on the 23d, and the perforation in the anterior half of the drum was first discovered on the 25th. Sulfathiazole powder was sprinkled in the canal at this time, according to the patient. The first time I looked at the drum I was sure about the two perforations but the second time I was less sure. The small hole seemed to be completely closed and the larger one could have been covered by a more transparent tissue than made up the rest of the drum, by appearance. Is this probable or common? Is it sometimes possible to mistake an intact drum for one that apparently has a large definite perforation?

Hal E. Bennett, M.D., Vilas, Fla.

Answer.—Perforations in the drum membrane that do not involve more than a fourth or a third of the total area tend to heal themselves spontaneously with a thin transparent scar, which through an ordinary ear speculum may be so thin that it still looks like a perforation. By means of magnification or a speculum with air pressure attachment, such as a Siegel speculum permitting the drum to be moved in and out by air pressure, these thin scars are readily discernible.

A small perforation that does not close spontaneously may often be closed by the careful application of a minute amount of trichloroacetic acid to the margins of the perforation followed by the application of a tiny paper patch, best made from cigaret paper and moistened with 1 per cent phenol in glycerin. This treatment may have to be repeated once or twice at intervals of two or three weeks until the perforation has closed.

Both the application of the trichloroacetic acid and the paper patch requires considerable dexterity and experience with ear treatments and should not be attempted by one who is not thoroughly conversant with the ear and delicate manipulations around the drum membrane.

STERILIZATION OF SHOES WITH FORMALDEHYDE SPRAY

To the Editor:—In the Oct. 5, 1940 issue of The Journal under Queries and Minor Notes, page 1215, a question was asked regarding the sterilizing of fungus-infected shoes with formaldehyde. May I suggest the following method, which is simple, effective, inexpensive and readily applicable to large numbers of shoes: An ordinary nasal atomizer is filled with solution of formaldehyde. With the tip of the atomizer well up in the toe of the shoe (the shoe lying on its side) one compression of the atomizer bulb sends a cloud of formaldehyde vapor into the forepart of the shoe. Then the tip of the atomizer is moved to the heel section of the shoe and the bulb is again compressed once, sending another cloud of vapor into the hind part of the shoe. The spraying should be performed on three successive nights. Shoes can be worn during the day. Tests have shown that it required three successive daily sprayings to effect a thorough sterilization. Shoes should not be worn until at least eight hours after spraying. As formaldehyde vapor is irritating to the eyes, the respiratory tract and the skin, the spraying should be done well away from the face of the operator, in a well ventilated room, and rubber gloves may be worn. When not in use the tip of the atomizer should be sealed with a pin, as this prevents plugging by corrosion. Further details can be found in an article by Birnbaum and White-Sweet: (Simple Method of Sterilizing Fungi-Infected Shoes, *M. Bull. Vet. Admin.* **17**:48 [July] 1940).

Leo Birnbaum, M.D., Downey, Ill.